A Preliminary Study

# *Nutritional Value of Turkey Proteins*[1]

**S. P. YANG, Ph.D.**
**HELEN E. CLARK, Ph.D.**
**and GLADYS E. VAIL, Ph.D.**[2]

*Department of Foods and Nutrition, Agricultural Experiment Station, and School of Home Economics, Purdue University, Lafayette, Indiana*

***Utilization of turkey proteins as compared with casein, using the young rat as the experimental animal***

TURKEY MEAT has been considered only recently as a year-round food. Although the essential amino acid composition of turkey meat has been reported (1), the nutritional qualities of turkey proteins have not been established. The present report describes a preliminary study determining the nutritive value of the proteins in turkey meat for the growing rat when turkey meat was used as the sole source of protein.

## *Experimental Procedure*

Dark (leg) meat from thirty-two-week-old Broad Breasted Bronze female turkeys fed a commercial turkey ration was used. The meat was freed as completely as possible from tendon and fat, then dried by lyophilization in a VirTis macro freeze-dryer. The dried turkey meat contained 78 per cent protein ($N \times 6.25$) and 16 per cent fat (alcohol-ether-extract).

Male weanling rats of Sprague-Dawley strain were used. They were housed individually in suspended wide mesh wire cages, in an air conditioned room at approximately 78°F. and 40 per cent relative humidity. Food and water were given *ad libitum*, and the animals were weighed twice weekly during a four-week experimental period.

Groups of ten rats each were fed an otherwise adequate basal diet containing dried turkey meat at the 5, 10, 15, or 20 per cent protein level. Comparable control groups were fed the same basal diet with vitamin-free casein[3] added to give the same protein levels.

The composition of the basal diet, in per cent, was as follows: sucrose, 84; corn oil, 10; Jones and Foster salts (2), 4; and non-nutritive bulk[4], 2. Vitamins were supplied in milligrams per 100 gm. diet as follows: ascorbic acid, 10; vitamin $B_{12}$, 0.02; biotin, 0.02; calcium pantothenate, 5; choline chloride, 100; folic acid, 0.2; inositol, 100; menadione, 0.5; niacin, 3; para-aminobenzoic acid, 10; pyridoxine · HCl, 0.5; riboflavin, 1.2; thiamine · HCl, 0.6; alpha-tocopherol acetate, 5; and oleum percomorphum, 15 (which provided 900 and 127 U.S.P. units of vitamins A and D, respectively). The vitamins and turkey meat or casein were incorporated into the basal diet at the expense of equal portions of sucrose. To equalize the fat content of all the experimental diets at 10 per cent level, the fat provided by turkey meat was considered and an appropriate amount of corn oil in the turkey diet was replaced by sucrose.

Biological value (3) was determined from the nitrogen metabolism measured during the last seven days of the four-week experimental period. Details of the procedures for nitrogen metabolism studies

[1]Journal Paper No. 1456, Purdue Agricultural Experiment Station. This work was supported in part by a grant from the National Turkey Federation, Mount Morris, Illinois. Received for publication July 2, 1959.

[2]The authors are grateful to Dr. W. J. Stadelman, Department of Poultry Science for the generous supply of turkey meat and use of the VirTis freeze-dryer; to Dr. M. L. Scott, Cornell University for valuable suggestions; to James M. Tuholski, M.D., Mead Johnson and Company for the supply of oleum percomorphum; and to Phyllis Mansfield, Jaclin Christian, Ivana Tobias, and Julia Frohreich for technical assistance.

[3]Nutritional Biochemicals Corporation, Cleveland.

[4]Alphacel, Nutritional Biochemicals Corporation, Cleveland.

have been described elsewhere (4). Nitrogen content was determined by a macro-Kjeldahl method with potassium sulphate and copper sulphate as catalysts[5].

At the termination of the experiment, following a 12-hr. starvation period, animals were sacrificed by the intraperitoneal injection of a pentobarbital sodium solution. The moisture, nitrogen, and fat of the livers and carcasses (minus liver and gastrointestinal tract) were determined. The carcasses were prepared for analysis by the method of Sarett and Snipper (5).

The moisture content was determined by drying the sample to constant weight (±0.0004 mg.) in a vacuum oven at 60°C. To determine the fat content, the dried sample was ground with sand and subsequently extracted for 15 min. with a 3:1 absolute ethyl alcohol-anhydrous ethyl ether mixture on a water bath. This mixture was filtered and the residue re-extracted for 4 hr. with anhydrous ethyl ether on a Goldfisch extractor. The ether extract was added to the alcohol-ether filtrate and then evaporated to dryness.

## *Results and Discussion*

Growth data of the young rats fed diets containing graded levels of protein provided by turkey meat or casein are summarized in Table 1. When the percentage of protein provided by either source was increased, both food intake and weight gain increased accordingly. The food intakes and weight gains of the rats fed diets containing turkey protein at the 5 or 10 per cent level were statistically greater ($P<0.001$) than those of the comparable groups receiving casein. Statistical significance of the differences between the means set at $P<0.001$ was determined by the "t" test (6). When the diets contained turkey meat at the 15 or 20 per cent protein level, food intake and weight gain were not statistically different from the values obtained with comparable diets containing casein.

As shown in Table 1, the maximum protein-efficiency ratio occurred when either turkey or casein was fed at the 10 per cent protein level. The protein-efficiency ratio obtained with diets containing turkey meat at the 5 or 10 per cent protein level was significantly greater than that of the comparable group fed casein. The ratios obtained with diets containing turkey meat at the 15 or 20 per cent protein level and those of the comparable diets containing casein were practically identical.

Obeying the principle of diminishing returns, biological value of either turkey or casein declined as the level of dietary protein rose (Table 1). The biological value of turkey proteins fed at the 5 per cent protein level was significantly greater than that of casein under comparable conditions. Although the biological values of turkey proteins fed at the 10, 15, and 20 per cent levels were different from the comparable values obtained with casein, the differences were not statistically significant.

These findings have shown that the nutritional value of turkey proteins was superior to that of casein when fed at the lower protein levels, whereas no significant difference was observed when fed at the higher protein levels.

Data pertaining to the moisture, nitrogen, and fat content of livers and carcasses are summarized in Table 2. The hepatic moisture content of the various groups ranged from 72.5 to 75.5 per cent. There was a tendency toward a direct relationship between the dietary protein level and the hepatic nitrogen content. No further improvement in hepatic nitrogen content was observed when the turkey diets contained protein above the 10 per cent level. With the casein diets, the maximum hepatic nitrogen content did not occur until the diet contained 15 per cent protein. The hepatic fat of the rats fed diets containing turkey or casein at the 5

[5]Kelpak Powder No. 2, Harshaw Scientific Company, Cleveland.

**TABLE 1 Mean food intake, weight gain, protein-efficiency ratio* and biological value† on diets containing graded levels of protein by turkey meat or casein**

| SOURCE OF PROTEIN | LEVEL OF PROTEIN | FOOD INTAKE | WEIGHT GAIN | PROTEIN EFFICIENCY RATIO | BIOLOGIC VALUE |
|---|---|---|---|---|---|
| | % | *gm.* | *gm.* | | % |
| Turkey | 5 | 229±18‡ | 33± 5‡ | 2.85±0.29‡ | 78± 3.2‡ |
| Turkey | 10 | 401±54 | 141±23 | 3.51±0.14 | 77± 8.7 |
| Turkey | 15 | 420±37 | 177±23 | 2.80±0.20 | 64± 4.3 |
| Turkey | 20 | 474±26 | 210±10 | 2.20±0.07 | 48± 4.2 |
| Casein | 5 | 187±19 | 14± 6 | 1.42±0.53 | 68± 4.2 |
| Casein | 10 | 308±34 | 85±14 | 2.75±0.19 | 69± 1.9 |
| Casein | 15 | 424±28 | 176±15 | 2.76±0.12 | 58±10.5 |
| Casein | 20 | 438±36 | 194±19 | 2.21±0.08 | 55± 5.4 |

*Weight gain in grams per gram of protein eaten.

†$\frac{\text{Nitrogen intake—(fecal nitrogen + urinary nitrogen)} \times 100}{\text{nitrogen intake—fecal nitrogen}}$

‡Mean ± standard error of the mean.

**TABLE 2 Moisture, nitrogen, and fat content of liver and carcass of rats fed diets containing graded levels of protein provided by turkey meat or casein**

| SOURCE OF PROTEIN | LEVEL OF PROTEIN | LIVER | | | CARCASS | | |
|---|---|---|---|---|---|---|---|
| | | Moisture | Nitrogen | Fat | Moisture | Nitrogen | Fat |
| | % | % | % | % | % | % | % |
| Turkey | 5 | 73.1±2.4* | 2.91±0.23* | 6.9±2.4* | 64.8±1.1* | 3.10±0.14* | 12.6±1.2* |
| Turkey | 10 | 73.9±1.4 | 3.39±0.39 | 4.8±0.8 | 65.0±2.5 | 3.11±0.11 | 13.9±3.4 |
| Turkey | 15 | 74.1±2.1 | 3.46±0.22 | 4.4±0.6 | 65.4±1.9 | 3.27±0.10 | 12.6±2.5 |
| Turkey | 20 | 72.5±1.8 | 3.44±0.30 | 4.6±0.6 | 64.8±1.9 | 3.22±0.14 | 13.3±2.2 |
| Casein | 5 | 74.1±1.8 | 3.18±0.31 | 6.3±1.5 | 66.5±1.3 | 3.18±0.10 | 10.2±1.8 |
| Casein | 10 | 75.5±1.3 | 3.09±0.18 | 4.3±1.0 | 65.4±1.2 | 3.16±0.07 | 12.7±2.0 |
| Casein | 15 | 73.4±1.9 | 3.39±0.20 | 4.8±0.8 | 63.9±2.5 | 3.17±0.11 | 14.1±2.2 |
| Casein | 20 | 73.5±1.9 | 3.44±0.22 | 4.6±0.7 | 64.7±2.2 | 3.18±0.11 | 13.5±2.9 |

*Mean ± standard error of the mean.

per cent protein level was higher than that of any other dietary group. The differences, however, were not statistically significant. The liver fat of the rats fed diets containing 10, 15, or 20 per cent protein, provided by either turkey or casein, was essentially the same.

The moisture content of the carcasses of various groups ranged from 63.9 to 66.5 per cent, while the nitrogen content was practically identical. There was an inverse relationship between the carcass moisture and fat content. No significant difference was observed in fat content of rats fed graded levels of turkey proteins, whereas the carcass fat increased accordingly with the protein content of the casein diets.

In an attempt to interpret the present findings, the essential amino acid content of leg meat of female turkeys and casein, amino acid requirement of young rats, and amino acid content of the experimental diets expressed as a percentage of requirement are presented in Table 3. Cystine and tyrosine were converted into the equivalents of methionine and phenylalanine by multiplying with the factors, 1.24 and 0.912, respectively (10).

It is interesting that the nutritional value of turkey protein was superior to that of casein when fed at the 5 or 10 per cent protein level (Table 1), although the phenylalanine (plus tyrosine) and tryptophan content of turkey meat was markedly lower than that of casein (Table 3). The superiority of the proteins in turkey meat may be due to the difference in the sulphur amino acid content since casein is known to be deficient. At the lower levels of protein intake, the deficiency manifests itself (11). Further experiments are being conducted in this laboratory to elucidate this effect.

As shown in Table 3, the diets containing turkey or casein at the 15 or 20 per cent protein level provided more of the essential amino acids than the quantities required for rat growth, except that the 15 per cent turkey protein diet provided only 80 per cent of the tryptophan required. This may account for the fact that the nutritional quality of turkey proteins was not different from that of casein when fed at the 15 or 20 per cent protein level.

## *Summary*

A preliminary experiment was conducted to determine the protein quality of turkey meat. The leg

**TABLE 3 Amino acid content of two proteins and eight experimental diets**

| AMINO ACID | TURKEY (1) | CASEIN (7) | REQUIREMENT OF YOUNG RAT (8, 9) | AMINO ACID IN DIETS EXPRESSED AS A PERCENTAGE OF REQUIREMENT* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 5% protein diet | | 10% protein diet | | 15% protein diet | | 20% protein diet | |
| | | | | Turkey | Casein | Turkey | Casein | Turkey | Casein | Turkey | Casein |
| | % | % | % | % | % | % | % | % | % | % | % |
| Arginine | 6.4 | 4.1 | 0.20 | 160 | 102 | 320 | 205 | 480 | 308 | 640 | 410 |
| Histidine | 2.6 | 3.0 | 0.25 | 52 | 60 | 104 | 120 | 156 | 180 | 208 | 240 |
| Isoleucine | 4.9 | 6.6 | 0.55 | 44 | 60 | 89 | 120 | 134 | 180 | 178 | 240 |
| Leucine | 7.5 | 10.1 | 0.70 | 54 | 72 | 107 | 144 | 160 | 216 | 214 | 288 |
| Lysine | 8.9 | 8.1 | 0.90 | 50 | 45 | 99 | 90 | 148 | 135 | 198 | 180 |
| Methionine (+cystine) | 3.8 | 3.6 | 0.50 | 38 | 36 | 76 | 72 | 114 | 108 | 152 | 144 |
| Phenylalanine (+tyrosine) | 5.1 | 10.8 | 0.70 | 36 | 77 | 73 | 154 | 110 | 231 | 146 | 308 |
| Threonine | 4.0 | 4.3 | 0.50 | 40 | 43 | 80 | 86 | 120 | 129 | 160 | 172 |
| Tryptophan | 0.8 | 1.3 | 0.15 | 26 | 44 | 53 | 87 | 80 | 130 | 106 | 174 |
| Valine | 5.1 | 7.4 | 0.55 | 46 | 68 | 93 | 135 | 140 | 202 | 186 | 270 |

*$\frac{\text{Amino acid content} \times 100}{\text{amino acid requirement}}$

meat of Broad Breasted Bronze female turkeys was dried by lyophilization in a VirTis macro freeze-dryer. Groups of male weanling rats were fed an otherwise adequate basal diet containing dried turkey meat at the 5, 10, 15, or 20 per cent protein level. Control groups were fed the same basal diet with vitamin-free casein added at the same protein levels.

In a four-week period, the average food intake, weight gain, and protein-efficiency ratio on diets containing turkey meat at the 5 or 10 per cent protein level were significantly greater than those on the comparable casein diets. There was no measurable difference between the nutritive value of these two proteins when fed at the 15 or 20 per cent protein level. It is suggested that the nutritional superiority of turkey proteins over those of casein when fed at the lower levels of protein may be due to the difference in sulphur amino acid content.

Data on moisture, nitrogen, and fat content of livers and carcasses are presented and discussed.

## *References*


(1) SCOTT, M. L.: Composition of turkey meat. 3. Essential amino acid composition. J. Am. Dietet. A. 35: 247, 1959.

(2) JONES, J. H., AND FOSTER, C.: A salt mixture for use with basal diets either low or high in phosphorus. J. Nutrition 24: 245, 1942.

(3) MAYNARD, L. A., AND LOOSLI, J. K.: Animal Nutrition. 4th ed. N.Y.: McGraw-Hill Book Co., Inc., 1956.

(4) CLARK, H. E., HOOPER, A. S., AND MCCORD, M. L.: The nutritive value of the proteins of beef extracted with different solvents, and of egg, milk and wheat germ for the growing rat. J. Nutrition 55: 63, 1955.

(5) SARETT, H. P., AND SNIPPER, L. P.: Comparison of fructose and glucose in the diet of alloxan-diabetic rats. J. Nutrition 52: 525, 1954.

(6) SNEDECOR, G. W.: Statistical Methods. 5th ed. Ames, Iowa: Iowa State College Press, 1956, chap. 11.

(7) ORR, M. L., AND WATT, B. K.: Amino Acid Content of Foods. USDA Home Econ. Research Rpt. No. 4, 1957.

(8) RAMARAO, P. B., METTA, V. C., AND JOHNSON, B. C.: Essential amino acid and protein requirements of the growing rat. Fed. Proc. 16: 397, 1957.

(9) ROSE, W. C., SMITH, L. C., WOMACK, M., AND SHANE, M.: The utilization of the nitrogen of ammonium salts, urea, and certain other compounds in the synthesis of non-essential amino acids *in vivo*. J. Biol. Chem. 181: 307, 1949.

(10) ROSE, W. C., AND WIXOM, R. L.: The amino acid requirements of man. 13. The sparing effect of cystine on the methionine requirement. 14. The sparing effect of tyrosine on the phenylalanine requirement. J. Biol. Chem. 216: 763, 1955; 217: 95, 1955.

(11) SCOTT, H. M. (Univ. of Ill.): Personal communication, 1959.


### New Data on Weight and Mortality

Weights of women in their twenties today average at least 5 lb. less than three or four decades ago. In fact, women of all ages now tip the scales several pounds lighter. This is partly due to lighter clothing, but mainly reflects the vogue for slenderness in fashion. In contrast, the average weight of short and medium height men in their twenties and thirties is now about 5 lb. more than a generation ago. The increase in men's weights at other ages and also for tall men has been generally smaller.

There is a great deal of information of pertinent interest to dietitians which is included in the new report, *1959 Build and Blood Pressure Study*, issued in October by the Society of Actuaries. The data were obtained from punch cards supplied by twenty-six companies that carry 65 per cent of this country's life insurance and covered 4.9 million policies issued between 1935 and 1953. By the close of the study period in 1954, there had been 133,000 deaths in the sample. The survey is by far the most comprehensive of its kind ever made.

In considering the main causes of death among overweights, markedly increased mortality was shown in relation to diabetes, followed by certain digestive diseases, such as gall bladder disease. With further additions to body weight, death rates from heart disease rose sharply. Overweight accompanied by hypertension was shown to portend increased danger, since with both conditions, mortality rates are much greater than accounted for by the two conditions considered separately.

Conversely, the lowest mortality occurs among persons whose blood pressure is below average. A similar finding was made with respect to weight. The underweight person's longevity is better than that of one of average or above-average weight.

What happens to mortality rates of people who reduce? Data on this are also presented. Weight reduction pays. Those who were overweight when insured, but were later given standard insurance because of sustained weight reduction, showed an immediate benefit of normal mortality, which continued for at least ten years. After that, some apparently put on weight again, as the mortality for the group as a whole began to increase.

Effect on Cooking Time, Palatability, Weight Loss, and Fuel Consumption

# *Conventional Roasting vs. High-Temperature Foil Cookery*[1]

**GERTRUDE G. BLAKER, J. L. NEWCOMER, Ph.D., and WILLIAM D. STAFFORD**

*School of Hotel, Restaurant, and Institutional Management, and Industry Research Center, Michigan State University, East Lansing*

AN UNDATED PRESS release from an aluminum foil manufacturer[2] has claimed that meats roasted in aluminum foil are more tender, equally as tasteful, require less cooking time, shrink less, and possess equal or better eye appeal than meats roasted by conventional methods. An unpublished study done at the Illinois Institute of Technology has confirmed this claim (1). Disadvantages to this method of roasting, however, have also been observed. Some investigators have found that roast beef prepared in aluminum foil acquired a "steamed" appearance and flavor. It has been suggested that the "steamed" effect might be overcome if oven temperatures of 450° to 500°F. are used when roasting in foil instead of 300° to 350°F. commonly used in conventional roasting. A review of the available literature reveals considerable disagreement in these claims. If the claims favorable to foil cookery are factual, this method offers a potential saving to the food service industry. If the claims are partially or entirely unfounded, the procedure could be a costly one.

This study was developed to compare the quality and weight loss of boneless U.S. Choice top round of beef and ready-to-eat hams cooked by conventional roasting methods at 350°F. and similar products wrapped in aluminum foil and cooked at 450° to 500°F. Fuel consumption and cooking times for each method of cookery were recorded.

## *Procedure*

Tests were conducted with ready-to-eat hams and boneless U.S. Choice top round of beef. All cooking was done in a single deck Trubake gas-fired oven, with a 30 by 42 in. hearth, 12 in. deep. The oven temperature and the center temperatures of the meats were recorded simultaneously by a Brown six-point, indicating recording potentiometer, using iron-constantin thermocouples in the oven space and embedded within the samples. The aluminum foil was 0.0015 in. thick, polished on both sides. Fuel consumption was measured by a dry type, commercial gas meter. The oven was preheated for ½ hr.

### PREPARATION OF HAMS

Eleven hams from the same side of the animal were used. The hocks were removed by cutting straight across the stifle joint; all skin was removed and surface fat was trimmed to approximately ½ in. in thickness. A thermocouple was embedded in the center of the thickest part of each ham. All foil-wrapped hams were tightly wrapped and sealed. Each ham was cooked separately. Hams were placed on a wire rack resting over a shallow roasting pan and positioned in the center of the oven hearth.

Four ready-to-eat hams, approximately the same weight (15 lb. 5½ oz. to 16 lb. 4¾ oz.), were cooked to a center temperature of 145°F. Two hams were cooked unwrapped at 350°F., while two foil-wrapped hams were cooked at 500°F. The cooking time needed to achieve the 145°F. internal temperature for each specimen was recorded.

Seven ready-to-eat hams, approximately the same weight (13 lb. 11½ oz. to 14 lb. 13¼ oz.), were cooked, using "minutes per pound" as the basis for determining the end point of cooking. Three hams were cooked unwrapped at 350°F., using 14, 16, and 18 min. per pound respectively to determine total

[1]Received for publication May 20, 1959.
[2]Reynolds Metals Company.

**TABLE 1 Cooking time, fuel use, and shrinkage for ready-to-eat hams roasted wrapped in aluminum foil and unwrapped**

| PREPARATION OF HAM | OVEN TEMPERATURE | INTERNAL TEMPERATURE | COOKING TIME | RAW WEIGHT | COOKED WEIGHT | WEIGHT LOSS | DRIPPINGS | FUEL CONSUMPTION | TOTAL TIME TO WRAP AND COOK |
|---|---|---|---|---|---|---|---|---|---|
| **Internal Temperature Determined End Point of Cooking** | | | | | | | | | |
| | *°F.* | *°F.* | *min./lb.* | *lb. oz.* | *lb. oz.* | *%* | *%* | *cu.ft.* | *min./lb.* |
| Wrapped | | | | | | | | | |
| Ham No. 1 | 500 | 145 | 13.4 | 16 3¾ | 11 6½ | 29.74 | 14.73 | 850 | 14.5 |
| Ham No. 2 | 500 | 145 | 13.9 | 15 12 | 11 15½ | 24.00 | 12.69 | 1000 | 16.1 |
| Unwrapped | | | | | | | | | |
| Ham No. 3 | 350 | 145 | 15.9 | 15 5½ | 12 4 | 20.16 | 8.55 | 500 | 15.9 |
| Ham No. 4 | 350 | 145 | 15.9 | 16 4¾ | 12 10¾ | 22.24 | 11.41 | 450 | 15.9 |
| **Minutes-per-Pound Determined End Point of Cooking** | | | | | | | | | |
| Wrapped | | | | | | | | | |
| Ham No. 5 | 500 | 108 | 10 | 14 13¼ | 12 15 | 12.74 | 5.80 | 700 | 10.6 |
| Ham No. 6 | 500 | 134 | 12 | 13 12¾ | 11 7¼ | 16.98 | 7.02 | 850 | 13.1 |
| Ham No. 7 | 500 | 145 | 14 | 13 11½ | 10 14¾ | 20.34 | 8.9 | 900 | 14.1 |
| Ham No. 8 | 500 | 153 | 16 | 14 7½ | 10 7¼ | 27.75 | 9.4 | 1050 | 16.7 |
| Unwrapped | | | | | | | | | |
| Ham No. 9 | 350 | 134 | 14 | 13 11½ | 11 5½ | 17.31 | 6.60 | 500 | 14.0 |
| Ham No. 10 | 350 | 143 | 16 | 14 13 | 11 11¼ | 20.99 | 8.20 | 500 | 16.0 |
| Ham No. 11 | 350 | 154 | 18 | 14 2¾ | 10 15½ | 22.60 | 7.90 | 600 | 18.0 |

time in the oven. Four foil-wrapped hams were cooked at 500°F. using 10, 12, 14, and 16 min. per pound respectively. Internal temperature of each sample was recorded at the end of the predetermined cooking period.

PREPARATION OF BEEF ROASTS

Twelve boneless top round U.S. Choice beef roasts were used. A thermocouple was embedded at the center of the thickest part of each roast. All foil-wrapped beef roasts were tightly wrapped and sealed. Each roast was placed on a wire rack resting over a shallow roasting pan.

Four beef roasts weighing approximately 12 lb. each were roasted to an internal temperature of 145°F. Two unwrapped beef roasts were cooked simultaneously in a 350°F. oven while two foil-wrapped beef roasts were cooked simultaneously in a 500°F. oven. Because the rate of temperature rise differed slightly for each roast, the internal temperatures actually varied from 142° to 146°F. However, since the roasts were cooked to essentially the same internal temperature, this slight deviation from 145°F. was considered inconsequential. Cooking time was recorded for each roast.

Six beef roasts weighing approximately 8 lb. each were cooked using "minutes per pound" as the basis for determining end point of cooking. Three roasts were cooked unwrapped in a 350°F. oven, and three foil-wrapped roasts were cooked in a 450°F. oven. In each case, 18, 20, and 22 min. per pound, respectively, were used to determine the total time in oven. Each roast was cooked separately and was positioned in the center of the oven hearth. Internal temperature of each roast was recorded at the end of the predetermined cooking period.

Two beef roasts of approximately the same weight were cooked at predetermined oven temperatures using 20 min. per pound as the basis for determining the end point of cooking. One roast was cooked unwrapped at 350°F. and one foil-wrapped roast was cooked at 425°F. Each roast was positioned in the center of the oven hearth. Internal temperature of each roast was recorded at the end of the predetermined cooking period.

EVALUATION

Fuel consumption was defined as the fuel used from the time the specimen entered the oven until it was removed. Cooking time related to the same time interval. All specimens were cooked to the same predetermined center temperature or for predetermined total time calculated as "minutes per pound." Center temperature or total time was used as the criterion for doneness.

Weight loss is reported as a percentage based on the original weight and the weight of the cooked specimen less the weight of the drippings.

Weights of unwrapped specimens and their drippings were determined immediately after specimens were removed from the oven. Foil-wrapped specimens were given a 10-min. stand-by period before foil was removed to allow for sufficient surface cooling to facilitate efficient handling of sample, at the same time reducing volatile losses. Weights were determined after foil was removed.

All samples were given a 20-min. stand-by period before scoring by the test panel.

Product scoring was executed by a test panel of seven to nine persons, consisting of five or seven trained home economists and two or three persons having average experience in testing work.

**TABLE 2** **Quality scores of ready-to-eat hams roasted wrapped in aluminum foil and unwrapped**

| PREPARATION OF HAM | EXTERNAL APPEARANCE* | INTERNAL TEXTURE† | AROMA* | FLAVOR‡ | JUICINESS* | WHOLE SAMPLE‡ | TOTAL SCORE¶ | STEAMED FLAVOR |
|---|---|---|---|---|---|---|---|---|
| **Internal Temperature Determined End Point of Cooking** | | | | | | | | |
| Wrapped | | | | | | | | |
| Ham No. 1 | 7.1 | 16.3 | 7.4 | 22.3 | 7.7 | 23.0 | 83.8 | distinct |
| Ham No. 2 | 6.2 | 12.0 | 7.0 | 20.3 | 5.7 | 18.0 | 69.2 | distinct |
| Unwrapped | | | | | | | | |
| Ham No. 3 | 5.8 | 11.6 | 5.4 | 14.4 | 6.8 | 15.6 | 59.6 | none |
| Ham No. 4 | 7.3 | 12.5 | 7.6 | 17.4 | 6.2 | 20.0 | 71.0 | none |
| **Minutes-per-Pound Determined End Point of Cooking** | | | | | | | | |
| Wrapped | | | | | | | | |
| Ham No. 5 | 5.8 | 14.0 | 6.1 | 20.1 | 6.8 | 18.0 | 70.8 | distinct |
| Ham No. 6 | 7.5 | 16.0 | 6.5 | 21.6 | 7.0 | 21.9 | 80.5 | distinct |
| Ham No. 7 | 6.9 | 15.0 | 7.1 | 21.2 | 6.5 | 18.9 | 75.6 | distinct |
| Ham No. 8 | 7.6 | 16.2 | 7.6 | 23.3 | 7.0 | 21.3 | 83.0 | distinct |
| Unwrapped | | | | | | | | |
| Ham No. 9 | 8.0 | 16.6 | 7.6 | 21.6 | 8.1 | 24.0 | 85.9 | none |
| Ham No. 10 | 5.1 | 14.6 | 7.0 | 21.2 | 8.0 | 21.3 | 77.2 | none |
| Ham No. 11 | 7.5 | 16.0 | 6.6 | 22.4 | 7.6 | 22.8 | 82.9 | none |

*Maximum possible score, 10.
†Maximum possible score, 20.
‡Maximum possible score, 30.
¶Maximum possible score, 110.

Palatability and characteristics of external appearance were scored by a hedonic scale. Nine phrases arranged along a line designed to suggest a single continuum which is emphasized by the successive degrees of effect of the verbal description were assigned numerical values. The average of these relative numbers for all test panel members was reported as the final score.

## *Results*

### HAMS

*Cooking Time.* When the hams were cooked to the same internal temperature, the average cooking time was 15.9 min. per pound for the unwrapped hams and 13.6 min. per pound for the foil-wrapped hams. The apparent saving in cooking time for the foil-wrapped ham was 2.3 min. per pound. If the average time necessary to wrap hams is considered as part of total preparation time, then the time necessary to prepare and cook the wrapped hams increased to 15.1 min. per pound. The time-saving, therefore, appears to be of little consequence.

In the seven samples where "minutes per pound" determined the end point of cooking, an apparent saving of 2 min. per pound cooking time was observed in the wrapped hams when compared with the unwrapped hams cooked to the same degree of doneness. When wrapping time was included as part

**TABLE 3** **Cooking time, fuel use, and shrinkage for U.S. Choice beef roasts cooked wrapped in aluminum foil and unwrapped**

| PREPARATION OF ROAST | OVEN TEMPERATURE | INTERNAL TEMPERATURE | COOKING TIME | RAW WEIGHT | | COOKED WEIGHT | | WEIGHT LOSS | DRIPPINGS | FUEL CONSUMPTION | TOTAL TIME TO WRAP AND COOK |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Internal Temperature Determined End Point of Cooking** | | | | | | | | | | | |
| | *°F.* | *°F.* | *min./lb.* | *lb.* | *oz.* | *lb.* | *oz.* | *%* | *%* | *cu.ft.* | *min./lb.* |
| Wrapped | | | | | | | | | | | |
| Roast No. 1 | 500 | 142 | 16.5 | 11 | 8½ | 8 | 0 | 30.62 | 15.18 | 800 | 17.5 |
| Roast No. 2 | 500 | 144z | 15.9 | 11 | 15 | 8 | 8 | 28.79 | 13.35 | 800 | 16.7 |
| Unwrapped | | | | | | | | | | | |
| Roast No. 3 | 350 | 142 | 18.4 | 11 | 6¼ | 9 | 1½ | 20.11 | 5.62 | 500 | 18.4 |
| Roast No. 4 | 350 | 146 | 18.4 | 11 | 5¾ | 8 | 13¾ | 22.0 | 7.15 | 500 | 18.4 |
| **Minutes-per-Pound Determined End Point of Cooking** | | | | | | | | | | | |
| Wrapped | | | | | | | | | | | |
| Roast No. 5 | 450 | 132 | 18 | 7 | 5¾ | 5 | 11 | 22.7 | 14.86 | 700 | 19.0 |
| Roast No. 6 | 450 | 136 | 20 | 7 | 9¼ | 5 | 11¼ | 24.7 | 12.16 | 750 | 21.1 |
| Roast No. 7 | 450 | 170 | 22 | 8 | 3¾ | 5 | 11¼ | 30.7 | 17.84 | 850 | 23.0 |
| Unwrapped | | | | | | | | | | | |
| Roast No. 8 | 350 | 120 | 18 | 8 | 2¼ | 6 | 13½ | 15.9 | 3.45 | 350 | 18 |
| Roast No. 9 | 350 | 126 | 20 | 8 | ¼ | 6 | 9¾ | 17.5 | 4.67 | 370 | 20 |
| Roast No. 10 | 350 | 138 | 22 | 8 | 3 | 6 | 7¾ | 20.8 | 4.77 | 450 | 22 |

**TABLE 4** **Quality scores of U.S. Choice beef roasts cooked wrapped in aluminum foil and unwrapped**

| PREPARATION OF HAM | EXTERNAL APPEARANCE* | INTERNAL TEXTURE† | AROMA* | FLAVOR‡ | JUICINESS* | INTERNAL COLOR† | WHOLE SAMPLE‡ | TOTAL SCORE¶ | STEAMED FLAVOR |
|---|---|---|---|---|---|---|---|---|---|
| **Internal Temperature Determined End Point of Cooking** | | | | | | | | | |
| Wrapped | | | | | | | | | |
| Roast No. 1 | 6.4 | 8.8 | 4.4 | 10.9 | 4.9 | 6.4 | 16.0 | 57.8 | distinct |
| Roast No. 2 | 5.6 | 12.0 | 5.2 | 15.6 | 5.4 | 7.2 | 17.0 | 68.0 | distinct |
| Unwrapped | | | | | | | | | |
| Roast No. 3 | 7.0 | 16.8 | 8.0 | 18.0 | 5.7 | 14.3 | 16.8 | 86.6 | none |
| Roast No. 4 | 7.3 | 15.0 | 7.7 | 24.0 | 8.3 | 13.3 | 20.4 | 96.0 | none |
| **Minute-per-Pound Determined End Point of Cooking** | | | | | | | | | |
| Wrapped | | | | | | | | | |
| Roast No. 5 | 1.3 | 8.0 | 4.0 | 4.5 | 1.8 | 9.0 | 6.0 | 34.6 | distinct |
| Roast No. 6 | 1.3 | 4.0 | 4.0 | 3.0 | 0 | 9.3 | 4.0 | 25.6 | distinct |
| Roast No. 7 | 0 | 0 | 1.0 | 0 | 0 | 0 | 0 | 1.0 | distinct |
| Unwrapped | | | | | | | | | |
| Roast No. 8 | 8.0 | 16.0 | 8.0 | 24.0 | 8.0 | 18.7 | 24.0 | 106.7 | none |
| Roast No. 9 | 8.0 | 14.7 | 6.7 | 22.0 | 8.7 | 17.3 | 24.0 | 101.4 | none |
| Roast No. 10 | 5.0 | 12.0 | 6.0 | 24.0 | 6.0 | 12.0 | 18.0 | 83.0 | none |

*Maximum possible score, 10.
†Maximum possible score, 20.
‡Maximum possible score, 30.
¶Maximum possible score, 110.

of the total preparation time, the saving decreased to approximately 1 min. per pound. (Table 1). Unwrapping time was not determined. This would further reduce the time-saving.

*Weight Loss.* Hams cooked to the same internal temperature showed an average weight loss of 21.20 per cent for the unwrapped products and 26.87 per cent for the foil-wrapped samples. In the samples cooked on the "minutes per pound" basis, weight loss for the foil-wrapped hams was the same as or greater than that for the conventionally prepared hams except for the foil-wrapped samples where the internal temperature was 134°F. or less (Table 1).

*Fuel Consumption.* The average fuel consumption was 483 cu. ft. for the unwrapped hams and 916 cu. ft. for the foil-wrapped hams (a 90 per cent increase in fuel consumption in cooking foil-wrapped hams) (Table 1).

*Palatability.* The quality scoring by the test panel showed no clear-cut preference for hams prepared by either method (Table 2). The average "whole sample" score for all hams cooked to approximately the same degree of doneness (143° to 145°F.) was 18.96 for unwrapped hams and 19.96 for foil-wrapped hams. The average total score for unwrapped hams was 69.26, while foil-wrapped hams had an average total score of 76.2. While these scores would seem to indicate a slight preference for the foil-wrapped product, careful examination of the data indicated no clear pattern of preference.

No close relation in quality of hams cooked to 143° to 145°F., either in the wrapped or unwrapped specimens was indicated. Unwrapped hams in this temperature range exhibited quality scores of 59.6, 71.0, and 77.2, while wrapped hams had scores of 83.8, 69.2, and 75.6. At the same time, there seemed to be no consistent pattern in the data illustrating the effect of increased "minutes per pound" either in the wrapped or unwrapped samples.

Since there is no evidence to indicate that the differences in quality were due to method or time of cooking, it would appear that the unwrapped sample scoring 59.6 was an inferior product even before cooking, while the wrapped sample scoring 83.8 was an exceptionally good product. In each case, these samples had an undue influence on the average total scores in their class. All of the foil-wrapped hams possessed a steamed flavor (Table 2).

### BEEF ROASTS

*Cooking Time.* In the four beef roasts cooked to the same internal temperature, the average cooking time for the unwrapped roasts was 18.4 min. per pound; that for the two foil-wrapped roasts was 16.2 min. per pound. The reduction of 2.2 min. per pound in cooking time for the wrapped roasts might be considered significant, but when the extra time required to wrap the roasts is considered, the net saving is reduced to only 1.3 min. per pound.

When "minutes per pound" was used to determine the end point of cooking, an apparent saving of 2 min. per pound was observed in the foil-wrapped samples. However, wrapping time decreased the time saved to approximately 1 min. per pound (Table 3). Unwrapping time was not determined. This would further reduce the time saved with the foil-wrapped product.

*Weight Loss.* There was a significant difference between the weight loss of the wrapped and unwrapped roasts cooked to the same degree of doneness. Average shrinkage for the unwrapped roasts was 21.05 per cent; for the foil-wrapped roasts, 29.7

per cent. In the samples cooked on the "minutes per pound" basis, the weight loss for the foil-wrapped roast was approximately 50 per cent greater than that of the unwrapped roasts.

The most significant comparison is to relate the weight loss of the unwrapped roast cooked at 22 min. per pound to the weight loss for the wrapped roast cooked at 18 min. per pound. On this basis, the foil-wrapped roast underwent 10 per cent greater weight loss, yet its internal temperature was less than the unwrapped roast (Table 3).

These results follow the same general pattern as those obtained in roasting meats in covered and uncovered pans. Cooking meat in foil more nearly approximates braising (cooking in a covered pan in the presence of liquid) than dry-heat roasting. Grindley and Mojoinner state (2): "The total losses were greater when meats were roasted in a covered pan than when they were cooked in an open pan, owing chiefly to the increased amount of water removed."

*Fuel Consumption.* The fuel used to cook the two unwrapped roasts to 143 to 145°F. internal temperature was 500 cu. ft., whereas for the two wrapped samples cooked to the same internal temperature, 800 cu. ft. fuel were used. Thus 60 per cent more fuel was needed for the foil-wrapped roasts (Table 3).

*Palatability.* In all of the factors scored, the unwrapped roasts rated higher. The most notable differences were in internal texture, aroma, internal color, and flavor. These scores were about 100 per cent higher for the unwrapped than for the foil-wrapped samples. The average total score for the unwrapped roasts was 91.1, while that for the foil-wrapped roasts was 62.9 (Table 4).

Both foil-wrapped roasts possessed a distinct steamed appearance and flavor.

In the six roasts cooked on a "minutes per pound" basis, the foil-wrapped roasts were definitely inferior. Note that the lowest total score for the unwrapped roast was two and a half times greater than the best score for a foil-wrapped roast.

All three of the foil-wrapped roasts possessed a distinct steamed flavor (Table 4).

### ALUMINUM FOIL AS A THERMAL INSULATOR

It was estimated that the insulating effect of aluminum foil was equivalent to lowering the oven temperature approximately 75°F. If this were true, then wrapping a roast in foil should require an increase in oven temperature of approximately 75°F. to accomplish the same degree of doneness as an unwrapped roast when both are cooked for the same length of time. A test was performed to check the validity of this assumption.

A foil-wrapped roast in a 425°F. oven reached the same center temperature (126°F.) as the unwrapped roast in a 350°F. oven, when both were cooked on a 20-min.-per-pound basis (Table 5).

**TABLE 5 Insulating effect of aluminum foil in roasts cooked at 20 min. per pound**

| MEASUREMENT | UNWRAPPED ROASTS | FOIL-WRAPPED ROASTS |
|---|---|---|
| Oven temperature (°F.) | 350°F. | 425°F. |
| Internal temperature (°F.) | 126°F. | 126°F. |
| Total cooking time | 2 hr. 40 min. | 2 hr. 21 min. |
| Raw weight | 8 lb. ¼ oz. | 7 lb. 1 oz. |
| Cooked weight | 6 lb. 9¾ oz. | 5 lb. 11½ oz. |
| Weight loss | 17.5% | 19.0% |
| Drippings | 4.67% | 13.94% |
| Fuel consumption | 370 cu. ft. | 660 cu. ft. |
| Total time to wrap and cook | 20 min./lb. | 20.6 min./lb. |

## *Summary*

Four ready-to-eat hams and four U.S. Choice beef roasts were cooked to an internal temperature of 145°F. Two samples of each were cooked unwrapped in a 350°F. oven while the other two were wrapped in foil and cooked in a 500°F. oven.

"Minutes per pound" was also used to determine the end point of cooking for seven hams and six beef roasts. Three specimens of each kind of meat were cooked unwrapped in a 350°F. oven; four foil-wrapped hams were cooked in a 500°F. oven and three foil-wrapped beef roasts were cooked in a 450°F. oven.

One beef roast was cooked unwrapped in a 350°F. oven and one foil-wrapped beef roast was cooked in a 425°F. oven for a predetermined length of time to measure the insulating effect of aluminum foil.

Cooking time, weight loss during cooking, internal temperature, and fuel consumption were determined for each sample.

Palatability and characteristics of external appearance were scored by a hedonic scale.

These tests indicate no distinct advantage to be derived by cooking ham or beef wrapped in foil. They did, however, reveal distinct disadvantages in terms of increased weight loss due to cooking, greater fuel consumption, and steamed flavor. These disadvantages were more pronounced in the fresh meat products (beef) than the cured products (ham).

Aluminum foil acted as a thermal insulator equivalent to lowering the oven thermometer approximately 75°F.

## *References*

(1) HARVEY, E. L.: Evaluation of aluminum foil as a wrap in the roasting of meat using restaurant techniques. Unpublished data.

(2) GRINDLEY, H. S., AND MOJOINNER, T.: Experiments on Losses in Cooking Meat. USDA Office of Exper. Sta. Bull. No. 141, 1904.

Effect on Cooking Time, Losses, and Quality

# *Cooking Pork Electronically*

**JEAN APGAR, NANCY COX, IRENE DOWNEY, and FAITH FENTON, Ph.D.**[2]

*State College of Home Economics and Agricultural Experiment Station, State University of New York, Cornell University, Ithaca*

SINCE ELECTRONIC ovens are now being used in homes, it is of interest to know how cooking in such ovens compares with conventional cooking. It is also of interest to know the effect of using the optional browning unit in the home electronic oven. Since the institutional electronic oven[3] has been used in public eating places for over a decade, a few studies on cooking meat in it have been reported (1-8). It is of interest to know whether these findings apply to food cooked in the newer home electronic ovens.

The purpose of this study, therefore, was to compare the effect on pork patties, roasts, and chops of cooking (a) electronically vs. conventionally; (b) with or without browning in a home electronic oven; and (c) in the home electronic vs. institutional electronic oven. Cooking times, cooking losses, palatability, objective color, shear values, and moisture, fat, and thiamine content were determined. In the patties, retention of moisture, fat, and thiamine during cooking was also obtained. The cooking drip of chops was analyzed for thiamine.

## *History of Meat*

Pork was obtained from the Animal Husbandry Department, New York State College of Agriculture at Cornell University. Patties were obtained two days before cooking and roasts and chops, one day. They were stored in a household refrigerator at approximately 5.6°C. (42°F.)

Roasts and chops were from Berkshire breed of hogs, except the last set of roasts which were from Yorkshire.

All roasts were obtained from carcasses weighing 200 to 250 lb. live weight, which is considered normal slaughtering weight, and chops from carcasses weighing 180 to 195 lb. All of the animals were on the same feed lot.

Meat for patties, which had been ground twice in an electric grinder, was approximately 30 per cent fat. It was shaped in a metal mold into 100-gm. patties, approximately 1 in. thick and 3 in. in diameter.

The four roasts used on any one cooking day were from one carcass, as were the chops. Fat was trimmed from the loins, leaving a covering of about ½ in.

One rib and one loin roast were cut from each paired loin after a 2-in. slice had been cut from the center for analysis of raw meat. Similarly, six loin and six rib chops, 1 in. thick, were cut from each paired loin after a 2-in.-thick slice had been removed for analysis.

## *Methods*

### COOKING METHODS

The institutional electronic oven had two magnetrons and the home electronic oven, one magnetron, but when the heat selector of each was turned to "Low," the power output into each oven was approximately the same, about 450 watts. The inside dimensions of the institutional oven were slightly larger (21¾ by 20 by 13 in.) than those of the home oven (14 by 18 by 12 in.) The home oven had a browning unit in the top of the oven and a fiberglass adjustable shelf with three possible positions; the institutional oven had neither. The oven used in con-

[1]Received for publication June 12, 1959.

[2]The authors wish to express their appreciation to Prof. G. H. Wellington for supervising the procurement of meat used in the study; to Dr. D. S. Robson for statistical designs and treatment of data; to Bwee Hwa Yap for thiamine analyses of the roasts; and to the following faculty who served as palatability judges: Jean Aitcheson, Faith Fenton, Ph.D., Ruth Lutz, Ph.D., Aimee Moore, Ph.D., Dr. J. J. Wanderstock, and Dr. G. H. Wellington.

[3]RADARANGE, Raytheon Manufacturing Co., Waltham, Massachusetts.

ventional cooking was a well insulated, electric test oven[4] with optional use of a rotating hearth.

All four cooking methods were used on each of the four cooking days.

In each study, the meat was allowed to stand at room temperature until it reached an internal temperature of 8.9°C. (48°F.) before cooking was started. All meat was cooked to an internal temperature of 87.8°C. (190°F.). This relatively high temperature was used because in preliminary studies with electronic ovens, a pink color was often observed in meat cooked to only 85°C. (185°F.). A special meat thermometer[5] developed for use in electronic ovens was used in all studies except in conventional cooking of chops.

A cooking lot of five patties weighed 500 gm.; one roast, approximately 1361 gm.; and six 1-in.-thick chops, 984 gm.

The time the browning unit was used in the home electronic oven was determined by the degree of browning obtained in preliminary studies. It varied with type of meat and also apparently with meat from a particular carcass. The times chosen were 8 min. for patties, 2 min. for roasts, and 6 min. for chops (Table 1). With some lots of meat, these times could have been increased.

Statistical designs for order of cooking method and for use of loin and rib roasts and chops were followed.

### SAMPLING

Although roasts and chops were cooked intact, only the longissimus dorsi muscle was stripped out for palatability, shear, color, and chemical tests. Similarly, in testing the raw meat, only this muscle was used. Therefore, when roasts and chops are mentioned, they refer to this muscle unless otherwise specified. The muscle is referred to hereafter as the *l. d. muscle*.

For palatability, each patty was cut into four radial sections, as was also the *l. d. muscle* of each chop. One-fourth-in. slices of the *l. d. muscle* were

[4]Despatch.
[5]Taylor Instrument Company, Rochester, New York.

**TABLE 1** **Cooking methods***

| COOKING METHOD | GLASS COOKING DISHES | POSITION IN OVEN | COVERING | COOKING TEMPERATURE | ELECTRONIC COOKING TIME | BROWNING TIME** | MEAN COOKING TIME | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Total | Per pound |
| **Pork Patties (five, 100-gm. each)** | | | | | *min.* | *min.* | *min.* | *min.* |
| Conventional oven† | round, 8-in. dia., 1½ in. deep | rotating hearth | none | 175.6°C. | — | — | 31 | 28.0 |
| Electronic oven‡ | | | | | | | | |
| Home type | | | | | | | | |
| No browning | | middle shelf | none | "low" (approx. 450 watts) | 5 | — | 5 | 4.5 |
| With browning | | top shelf | none | | 3 | 8 | 8 | 7.4 |
| Institutional type | | elevated 1¼ in. | glass pie plate | | 6 | — | 6 | 5.5 |
| **Pork Roasts (one 3-lb. [1361 gm.] roast)** | | | | | | | | |
| Conventional oven† | 8 in. sq., 1½ in. deep | rotating hearth | none | 175.6°C. | — | — | 110 | 37.0 |
| Electronic oven# | | | | | | | | |
| Home type | | | | | | | | |
| No browning | | bottom shelf | none | "low" (approx. 450 watts) | 24 | — | 24 | 7.5 |
| With browning | | bottom shelf | none | | 25 | 2 | 25 | 7.6 |
| Institutional type | | elevated 1¼ in. | Cellophane | | 26 | — | 26 | 8.0 |
| **Pork Chops (six, 1-in. thick [984 gm. total] each)** | | | | | | | | |
| Conventional oven¶ | 9 by 13½ by 1½ in. | stationary hearth | metal foil until 62.8°C. | 175.6°C. | — | — | 58 | 28.0 |
| Electronic oven | | | | | | | | |
| Home type | | | | | | | | |
| No browning | | middle shelf | Cellophane | "low" (approx. 450 watts) | 9 | — | 9 | 4.0 |
| With browning | | top shelf | Cellophane until 55.6°C. | | 9 | 6 | 10 | 4.5 |
| Institutional type | | elevated 1¼ in. | Cellophane | | 12 | — | 12 | 5.5 |

*All meat was cooked to 87.8°C. (190°F.) internal temperature. With the roasts, internal temperature rose several degrees after removal from oven.
†No turning during cooking.
‡Turned midway during cooking.
#Turned after two-thirds of cooking time had elapsed.
¶120 ml. water added.
**Browning unit and electronic unit were on simultaneously.

cut with a mechanical slicer from the posterior end of the roasts.

For color determination of cooked meat, one patty and the *l. d. muscle* of one chop were cut in half horizontally, and a ½-in. slice was cut from the center and the anterior end of the *l. d. muscle* of roasts.

For shear of roasts, a 1-in. core was taken from a 1½-in.-thick slice of the *l. d. muscle* cut anterior to the center slice. A 1-in. core was cut from the center of the *l. d. muscle* of one chop.

Meat remaining was ground twice, with mixing after each grinding, for use in chemical analysis.

COOKING DATA

Records were kept of weight of raw and cooked meat; cooking time; total cooking loss; total drip; fat in drip; drip exclusive of fat; and evaporation.

PALATABILITY

The over-all appearance of uncut meat was scored: patties for color and acceptability of color; roasts for aroma, moisture of surface, shape, color, and drip; and chops for color of surface fat and lean, moisture of surface, and shrinkage.

A statistical design was used for order of tasting meat cooked by each method and also for the number of the roast slice each judge received. A small piece of surface fat, approximately ½ by ½ by ⅛ in. from roasts and chops was scored for flavor.

Qualities scored were: aroma with sniffing, interior color, flavor, juiciness, and tenderness. Scores were for desirability, not intensity. Maximum possible score was 10; average was 5. Acceptability ratings were given.

SHEAR

The 1-in.-diameter cores, which were approximately 1 in. long (see sampling), were sheared once with a Warner-Bratzler shear apparatus soon after they reached room temperature.

COLOR

Color values of raw meat were not taken because all that was used on any one day was from the same animal and from the same area of the carcass.

"Rd" (intensity), "a" (redness), and "b" (yellowness) values of an inner slice (see sampling) of each lot of cooked meat were measured with the Hunter Color Difference Meter. The *Rd* value was the most meaningful. Most color change in pork dur-

**TABLE 2 Effect of cooking method and cooking time and losses from pork patties, roasts, and chops***

| COOKING METHOD | COOKING TIME | COOKING LOSSES | | | |
|---|---|---|---|---|---|
| | | Total weight loss | Drip loss, exclusive of fat | Fat in drip | Evaporation |
| | | **Pork Patties** | | | |
| | *min.* | % | % | % | % |
| Conventional oven | 31 | 36.3 | 1.7 | 20.4 | 14.3 |
| Electronic oven | | | | | |
| Home type | | | | | |
| No browning | 5 | 37.2 | 6.5 | 26.1 | 4.6 |
| With browning | 8 | 37.0 | 5.6 | 22.7 | 8.7 |
| Electronic unit | 3 | — | — | — | — |
| Browning unit | 8 | — | — | — | — |
| Institutional type | 6 | 36.4 | 7.7 | 23.7 | 5.0 |
| | | **Pork Roasts** | | | |
| Conventional oven | 110 | 25.0 | 0.9 | 8.2 | 15.7 |
| Electronic oven | | | | | |
| Home type | | | | | |
| No browning | 24 | 26.5 | 5.8 | 6.4 | 14 3 |
| With browning | 25 | 29.0 | 5.5 | 8.5 | 15.0 |
| Electronic unit | 25 | — | — | — | — |
| Browning unit | 2 | — | — | — | — |
| Institutional type | 26 | 25.3 | 3.4 | 5.2 | 16.8 |
| | | **Pork Chops** | | | |
| Conventional oven | 58 | 26.4 | 16.8† | — | 17.7 |
| Electronic oven | | | | | |
| Home type | | | | | |
| No browning | 9 | 17.7 | 14.7† | — | 2.9 |
| With browning | 10 | 24.3 | 12.5† | — | 11.8 |
| Electronic unit | 9 | — | — | — | — |
| Browning unit | 6 | — | — | — | — |
| Institutional type | 12 | 21.4 | 16.5† | — | 4.9 |

*Means of four tests. All meat cooked to an internal temperature of 87.8°C. (190°F.)
†Total drip.

ing cooking, exclusive of surface browning, is a graying which is indicated best by the *Rd* value. All cut surfaces were exposed to the air 30 min. before measurement. Measurements of the exterior surface of the *l. d. muscle* of roasts and chops were too inconsistent for interpretation, probably chiefly because of unevenness of surface.

Visual comparison was made of exterior browning of fat and lean of roasts and chops by ranking degree of browning from 1 (darkest browning) to 4 (lightest).

FAT, MOISTURE, AND THIAMINE

A modified Babcock method adapted from the 1950 A.O.A.C. method (9) for fat in milk was used for raw and cooked meat.

A modification of the 1950 A.O.A.C. method (9) for determination of moisture by vacuum drying was used for raw and cooked meat.

Thiamine was extracted from raw and cooked meat by a modified Watts, Peng, and Esselbaugh method (10) and was measured by a modification of the thiochrome method of Conner and Straub (11). Results were calculated on a dry, fat-free basis as well as on a moist, fat basis. Cooking drip of chops was also analyzed.

STATISTICAL TREATMENT

Data, including cooking losses, palatability scores, and fat, moisture, and thiamine content (dry, fat-free basis) of the cooked meat, were subjected to analysis of variance according to Snedecor (12).

Since statistical analysis indicated that variations due to standing time after cooking, rib vs. loin areas, and right vs. left sides were not significant, they were confounded in the pooled error.

Correlations were determined: juiciness vs. moisture, juiciness vs. fat, tenderness vs. fat, tenderness vs. shear.

## *Discussion of Results*

COOKING TIME

Cooking these particular amounts of pork conventionally required about five times as long as cooking electronically (Table 1).

The browning unit in the home electronic oven was needed for a shorter time for roasts than for patties and chops because the 3-lb. roasts were in the oven long enough that some browning occurred with electronic cooking only.

COOKING LOSSES

*Weight Loss.* No significant difference in total weight loss occurred from drained patties or roasts in conventional or electronic methods. Chops cooked conventionally, however, suffered significantly more weight loss, 26.4 per cent, than did those cooked in the home electronic oven without browning, 17.7 per cent (Tables 2 and 4). The addition of water in conventional cooking to prevent drying out may have increased losses. That conventionally-cooked roasts did not suffer greater weight loss during the long cooking may have been due to the ½-in. covering

**TABLE 3** **Effect of cooking method on palatability of pork patties, roasts, and chops**

| COOKING METHOD | SCORES FOR QUALITY FACTORS* | | | | | | |
|---|---|---|---|---|---|---|---|
| | Aroma | Color of cut surface | Flavor | | | Juiciness | Tenderness |
| | | | Lean | Fat | Over-all | | |
| **Pork Patties** | | | | | | | |
| Conventional oven | 7.2 | 7.7 | — | — | 7.2 | 7.0 | 7.3 |
| Electronic oven | | | | | | | |
| Home type | | | | | | | |
| No browning | 6.2 | 7.5 | — | — | 7.0 | 6.9 | 7.7 |
| With browning | 6.9 | 7.5 | — | — | 7.1 | 6.8 | 7.7 |
| Institutional type | 5.9 | 7.5 | — | — | 6.8 | 7.1 | 7.5 |
| **Pork Roasts** | | | | | | | |
| Conventional oven | 7.5 | 8.0 | 7.4 | 7.6 | — | 8.1 | 7.8 |
| Electronic oven | | | | | | | |
| Home type | | | | | | | |
| No browning | 7.6 | 7.8 | 7.4 | 7.2 | — | 6.7 | 7.2 |
| With browning | 7.6 | 8.1 | 7.4 | 7.6 | — | 7.1 | 7.3 |
| Institutional type | 7.8 | 7.8 | 7.3 | 6.9 | — | 7.0 | 7.3 |
| **Pork Chops** | | | | | | | |
| Conventional oven | 8.0 | — | 7.3 | 7.4 | — | 6.1 | 7.9 |
| Electronic oven | | | | | | | |
| Home type | | | | | | | |
| No browning | 7.3 | — | 7.6 | 6.3 | — | 7.4 | 7.6 |
| With browning | 7.4 | — | 7.5 | 7.2 | — | 7.3 | 7.9 |
| Institutional type | 7.5 | — | 7.7 | 6.5 | — | 6.8 | 7.5 |

*Means of four replicates. Maximum possible score, 10.

of fat on the top surface and to bones and membrane underneath.

Use of the browning unit in the home electronic oven did not significantly affect weight loss from patties and roasts. In chops, however, browning increased weight loss significantly from 17.7 to 24.3 per cent. The chops had a greater surface area in proportion to volume exposed to the heat from the browning unit than did the roasts.

*Drip and Evaporation.* The amount of fat in the drip, drip exclusive of fat, and evaporation varied with the type of pork, the length of cooking, and browning (Tables 2 and 4).

PALATABILITY

The only obvious difference in the over-all appearance of intact patties, roasts, and chops cooked by the four methods was surface. color. The

**TABLE 4 Mean values and significance of cooking losses and palatability scores recorded in Tables 2 and 3**

| FACTOR | MEAN SQUARES* | | SIGNIFICANCE OF METHOD | |
|---|---|---|---|---|
| | Method | Replicate | Methods significantly different from conventional | Electronic method significantly different from home electronic method without browning |
| **Pork Patties** | | | | |
| Total weight | 0.88 | 133.61** | — | — |
| Fat in drip | 23.01** | 281.31** | all electronic methods | home electronic oven with browning<br>institutional electronic oven |
| Drip exclusive of fat | 27.54** | 16.88** | all electronic methods | — |
| Evaporation | 81.76** | 3.52 | all electronic methods | home electronic oven with browning |
| Aroma | 1.44 | 1.09 | — | — |
| Color of center | 0.03 | 0.08 | — | — |
| Flavor | 0.09 | 0.78 | — | — |
| Juiciness | 0.07 | 0.49 | — | — |
| Tenderness | 0.12 | 0.35 | — | — |
| **Pork Roasts** | | | | |
| Total weight | 13.47 | 21.35 | — | — |
| Fat in drip | 9.44** | 3.82 | institutional electronic oven | — |
| Drip exclusive of fat | 20.78** | 1.70 | all electronic methods | institutional electronic oven |
| Evaporation | 4.55 | 8.66 | — | — |
| Aroma | 0.09 | 0.45 | — | — |
| Color of cut surface | 0.07 | 0.14* | — | — |
| Flavor of lean | 0 | 0.75 | — | — |
| Flavor of fat | 0.46* | 0.06 | institutional electronic oven | — |
| Juiciness | 1.57** | 1.20** | all electronic methods | — |
| Tenderness | 0.28* | 0.37* | home electronic oven without browning | — |
| **Pork Chops** | | | | |
| Total weight | 57.38* | 36.05 | home electronic oven without browning | home electronic oven with browning |
| Total drip | 15.38 | 36.07** | — | — |
| Evaporation | 183.23** | 8.18 | all electronic methods | home electronic oven with browning |
| Aroma | 0.35 | 0.23 | — | — |
| Flavor of lean | 0.11 | 0.14 | — | — |
| Flavor of fat | 1.25** | 0.63* | home electronic oven without browning<br>institutional electronic oven | home electronic oven with browning |
| Juiciness | 1.34** | 0.71* | home electronic oven without browning<br>home electronic oven with browning | — |
| Tenderness | 0.13 | 0.02 | — | — |

*Significant at the 5% level.
**Significant at the 1% level.

browned surface of meat cooked by conventional and home-electronic-with-browning methods was more acceptable than the lighter surface of those cooked by electronic methods without browning. Some surface browning of roasts occurred with electronic cooking only.

All of the meat had a more desirable aroma when cooked by the two browning methods.

The surfaces of patties and roasts cooked electronically without browning were more moist than those cooked by browning methods, no doubt because of shorter cooking time and less intense surface heating. The surface of all chops tended to be moist rather than dry, probably because they were covered for at least part of each cooking period.

Roasts showed little visible shrinkage in any cooking method, but small differences in shrinkage were visible in chops, probably because they had a larger proportion of surface to volume exposed. Chops cooked in the institutional electronic oven appeared to shrink less than those cooked in the home electronic or conventional oven.

Drip from conventionally-cooked pork was opaque, golden to dark brown in color, and contained small amounts of coagulum and grey-brown fat, while the drip from electronically-cooked pork was almost clear, light yellow to amber color, and contained appreciable amounts of coagulum and creamy white to light grey fat. Drip exclusive of fat from conventionally-cooked meat congealed on standing, but little or no congealing occurred in the larger amount from meat cooked electronically.

No statistically significant difference in mean scores for aroma or flavor of lean by the four methods occurred when samples consisting of one-fourth of a pattie and slice of the *l. d. muscle* of roasts and chops were considered. Furthermore there were no significant differences in any of the palatability factors of the patties (Tables 3 and 4).

As stated previously no significant differences in aroma or flavor of lean due to cooking method occurred. Conventional cooking of roasts resulted in higher juiciness scores for the *l. d. muscle* (8.1) than did electronic cooking (6.7 to 7.1).

Although little significant difference occurred in tenderness scores, there was a trend for the conventionally-cooked meat to receive higher scores. When the conventionally-cooked meat was given relatively low scores, it was because the meat was too tender. Low scores for electronically-cooked meat, however, were given because it was not tender enough.

Flavor of surface fat, as would be expected, was scored significantly higher from roasts cooked by the two browning methods (7.6) than by the institutional electronic method, (6.9).

As with roasts, scores for flavor of fat for the chops were higher with browning methods (7.4 and 7.2) than with non-browning methods (6.3 and 6.5). As stated previously, no significant differences in aroma or flavor of lean due to cooking method occurred.

The conventional method resulted in a significantly lower juiciness score (6.1) for the *l. d. muscle* of chops due to dryness than did the home electronic methods (7.4 and 7.3) This was the reverse of the finding with roasts. It can probably be explained by the chops having a relatively large cut surface area per volume for loss of moisture (cooking losses were also greater) while the *l. d. muscle* of roasts was well protected by surface fat, bone, and membrane. The effect of the addition of water to the conventionally-cooked chops is not known.

Tenderness scores for the conventionally-cooked chops, although not significantly different, tended to be slightly higher than for the electronically cooked.

In the home electronic oven, use of the browning unit increased flavor of fat scores for chops from 6.3 to 7.2.

### ACCEPTABILITY

All meat samples were rated acceptable regardless of cooking method. The method resulting in the highest acceptability varied with the type of meat.

Differences in acceptability of the one-fourth radial sections of patties cooked by the four methods were small, ranging from home electronic without browning (75 per cent) to institutional electronic (83.3 per cent) to both conventional and home electronic with browning, (87.5 per cent).

Differences in acceptability ratings of the *l. d. muscle* and exterior fat of roasts cooked by the four methods were also small: 87.5 per cent for conventional and institutional electronically-cooked, 91.7 for home electronic with browning, and 95.8 for home electronically-cooked roasts without browning.

The *l. d. muscle* of chops was scored acceptable 91.7 and 95.8 per cent of the time when cooked by non-browning methods and only 75.0 and 87.5 per cent by the two browning methods. Judges gave "dryness" as the reason for the lower acceptability of the conventionally-cooked meat. Apparently dryness was a more dominant factor than was surface color.

**TABLE 5 Significance of correlations of pork patties, roasts, and chops cooked by electronic and conventional methods**

| FORM OF PORK | CORRELATION COEFFICIENTS | | | |
|---|---|---|---|---|
| | Juiciness: moisture | Juiciness: fat | Tenderness: fat | Tenderness: shear |
| Patties | 0.14 | −0.10 | — | — |
| Roasts | 0.70* | 0.14 | 0.18 | 0.17 |
| Chops | 0.28 | −0.21 | 0.13 | −0.66* |

*Significant at 5% level.

CORRELATIONS

Only two correlations were significant, and each was found in only one of the three meats. They were juciness-moisture, 0.70, in *l. d. muscle* of roasts and tenderness-shear in *l. d. muscle* of chops, 0.66 (Table 5).

SHEAR

Mean shear values of the *l. d. muscle* of *raw* roasts was 15.0 lb. and of chops 20.6 lb. (Table 6).

Although no significant difference in shear values of *l. d. muscle* of either the *cooked* roasts or chops due to cooking method was found (Tables 6 and 7), the conventionally cooked meat tended to have the lowest shear values. It also had slightly higher tenderness scores (Table 3).

COLOR

*Rd* values of exterior surface of patties cooked conventionally were lower (14.38), indicating great-

**TABLE 6 Experimental means and significance of color, shear values, fat, moisture, and thiamine in pork**

| MEASUREMENT | RAW VALUES† | MEANS | | | | STANDARD ERROR (POOLED) TREATMENT MEAN‡ | ALLOWANCE FOR COMPARING# | | TREATMENTS¶ WITH SIGNIFICANT DIFFERENCE* FROM | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Conventional cooking | Electronic oven | | | | 1 vs. 2, 3 & 4 | 2 vs. 3 & 4 | Treatment 1 | Treatment 2 |
| | | | Home | | Institutional | | | | | |
| | | | Without browning | With browning | | | | | | |
| **Pork Patties** | | | | | | | | | | |
| Cut surface (Rd) | — | 25.48 | 23.28 | 24.50 | 23.80 | 1.07 | 4.323 | 3.948 | | |
| Exterior surface (Rd) | — | 14.38 | 20.65 | 15.18 | 19.95 | 1.44 | 5.818 | 5.314 | 2 | 3 |
| Fat content (%) | 33.6 | 24.02 | 24.28 | 24.65 | 24.90 | 0.45 | 1.818 | 1.661 | | |
| Fat retention (%) | — | 48.18 | 48.08 | 49.30 | 49.72 | 0.88 | 3.555 | 3.247 | | |
| Moisture content (%) | 50.0 | 47.78 | 47.90 | 46.62 | 47.58 | 0.30 | 1.212 | 1.107 | | 3 |
| Thiamine | | | | | | | | | | |
| Moist, fat basis (mg./100 gm.) | 0.52 | 60.88 | 60.12 | 58.62 | 60.45 | 0.51 | 2.060 | 1.882 | 3 | |
| Dry, fat-free basis (mg./100 gm.) | 3.20 | 1.542 | 1.588 | 1.592 | 1.592 | 0.04 | 1.162 | 0.148 | | |
| Retention (%) | — | 54.00 | 54.05 | 55.48 | 53.88 | 0.91 | 3.676 | 3.358 | | |
| **Pork Roasts‖** | | | | | | | | | | |
| Cut surface (Rd) | — | 38.40 | 38.55 | 37.00 | 37.90 | 1.13 | 4.565 | 4.170 | | |
| Exterior surface fat (Rd) | — | 20.92 | 28.65 | 21.62 | 28.22 | 3.61 | 14.584 | 13.321 | | |
| Shear (lb.) | 15.0 | 16.06 | 21.06 | 17.75 | 17.31 | 1.36 | 5.494 | 5.018 | | |
| Fat content (%) | 4.7 | 8.90 | 11.62 | 10.58 | 9.40 | 0.27 | 1.091 | 0.996 | 2,3 | 3,4 |
| Moisture content (%) | 71.1 | 55.50 | 52.92 | 51.98 | 53.20 | 0.58 | 2.343 | 2.140 | 2,3 | |
| Thiamine | | | | | | | | | | |
| Moist, fat basis (mg./100 gm.) | 0.60 | — | — | — | — | — | — | — | | |
| Dry, fat-free basis (mg./100 gm.) | 2.50 | 1.58 | 1.63 | 1.43 | 1.51 | no differences were significant | | | | |
| **Pork Chops‖** | | | | | | | | | | |
| Cut surface (Rd) | — | 34.95 | 44.38 | 41.78 | 38.62 | 2.34 | 9.454 | 8.635 | | |
| Shear (lb.) | 20.6 | 15.19 | 18.19 | 18.75 | 19.88 | 1.22 | 4.939 | 4.502 | | |
| Fat content (%) | 4.0 | 10.05 | 8.85 | 9.05 | 8.65 | 0.69 | 2.788 | 2.546 | | |
| Moisture content (%) | 72.7 | 54.00 | 57.50 | 58.68 | 57.80 | 0.64 | 2.586 | 2.362 | 2,3,4 | |
| Thiamine | | | | | | | | | | |
| Moist, fat basis (mg./100 gm.) | 0.77 | — | — | — | — | — | — | — | | |
| Dry, fat-free basis (mg./100 gm.) | 3.31 | 1.662 | 1.822 | 2.060 | 2.080 | 0.05 | 0.202 | 0.185 | 3,4 | 3,4 |
| In drip (mg./100 gm.) | — | 0.918 | 0.915 | 1.005 | 0.865 | 0.05 | 0.202 | 0.185 | | |
| Total in drip (mg.)‡ | — | 1.115 | 0.982 | 0.740 | 1.075 | 0.09 | 0.364 | 0.332 | 3 | |

*Significant at 5% level.

†Statistical analysis of the raw data and thiamine content of cooked meat on moist, fat basis was not done.

‡Including standing time, rib vs. loin, and right vs. left side.

#Based on Duncan's multiple range test.

¶Treatments: 1 = conventional cooking time: patties, 31 min.; roasts, 110 min.; chops, 58 min.; 2 = cooking time for home electronic oven without browning: patties, 5 min.; roasts, 24 min.; chops, 9 min.; 3 = cooking time for home electronic oven with browning: patties, electronic unit only, 3 min.; browning, 8 min.; roasts, electronic unit only, 25 min., browning, 2 min.; chops with electronic unit only, 9 min.; browning, 6 min.; 4 = cooking time for institutional electronic oven (no browning): patties, 6 min.; roasts, 26 min.; chops, 12 min.

‖*L.d. muscle* only.

††Drip exclusive of fat.

er browning or drying of surface, than those cooked home-electronically with no browning (20.65), institution-electronically (19.95), and home-electronically with browning (15.18).

That the two non-browning methods resulted in pale surface colors was plainly visible in the intact roasts and chops. Differences in chops were greatest —the unbrowned fat was not appetizing in appearance. Differences in patties were small.

FAT, MOISTURE, AND THIAMINE

*Fat.* Mean fat values of raw pork were: patties, 33.6 per cent (27.5 to 38.7); *l. d. muscle* of roasts, 4.7 per cent (2.8 to 6.5); *l. d. muscle* of chops, 4.0 per cent (2.0 to 6.9). The *l. d. muscles* of roasts cooked conventionally had a significantly lower fat content, 8.9 per cent, than those cooked in the home electronic oven, 10.6 and 11.6 per cent.

Although use of the browning unit in the home oven significantly reduced fat content of the *l. d. muscle* of roasts (Tables 6 and 7), it is probably of no practical significance.

*Moisture.* Moisture value of raw patties was 50.0 per cent (46.1 to 55.1); *l. d. muscle* of roasts, 71.1 per cent (69.8 to 72.2); and of chops, 72.7 per cent (70.7 to 74.0) (Table 6). The *l. d. muscles* of roasts cooked conventionally had a significantly higher moisture content, 55.5 per cent, than those cooked in the home electronic oven with or without browning, 52.0 and 52.9 per cent (Tables 6 and 7). Greater rise in post-oven temperature of electronically-cooked roasts may have resulted in greater moisture loss. Also, the protective layer of fat, membrane, and bone may have prevented loss of moisture from this muscle during the long conventional cooking.

The *l. d. muscle* of conventionally-cooked chops had a significantly lower moisture content, 54.0 per cent, than did those cooked electronically, 57.5 and 58.7 per cent. The two compensating conditions to the longer cooking time which existed in the roasts were not present in chops with their large surface area in proportion to volume.

Although use of the browning unit significantly reduced the moisture of patties, this was probably of no practical significance.

Patties conventionally cooked had a significantly higher moisture retention, 60.9 per cent, than did those from the other browning method, 58.6 per cent. This was probably due to the intense heat of the top browning unit in the home electronic oven.

*Thiamine.* Thiamine content on a dry, fat-free basis for raw ground pork was 3.20 mg. (2.54 to 3.77) per 100 gm.; for the *l. d. muscle* of roasts, 2.50 mg. (2.13 to 2.83); and of chops, 3.31 mg. (2.32 to 4.59). The only appreciable difference was in the content of the chops from younger, smaller animals which was apparently both higher and more variable.

Thiamine in patties and roasts was similar whether meat was cooked conventionally or electronically. In the *l. d. muscle* of chops, however, significant differences in thiamine content due to cooking method occurred: those cooked in the home electronic oven with browning contained more thiamine on the dry, fat-free basis, 2.06 mg. per 100 gm., as did also those cooked in the institutional electronic oven (2.08 mg.) than did those cooked either in the conventional oven (1.66 mg.), or in the home electronic oven without browning (1.82 mg.) (Tables 6 and 7). Since the difference was small—only 0.2 to 0.4 mg.—it was probably of no practical importance.

Lack of significant difference in the effect of cooking method on either thiamine content or retention, in spite of large differences in cooking time, indicates that electronic cooking may, in a given time, be more destructive of thiamine than conventional cooking. It may be that in electronic cooking

**TABLE 7 Mean squares and significance of color, shear values, fat, moisture, and thiamine in pork**

| SOURCE OF VARIANCE | DEGREES OF FREEDOM | COLOR Rd VALUE | | | SHEAR | FAT | | MOISTURE | | THIAMINE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cut surface lean | Exterior lean | Surface fat | | Content | Retention | Content | Retention | Content | Retention | Total drip† | Proportion of drip† |
| **Pork Patties** | | | | | | | | | | | | | |
| | | | | | | % | % | % | % | % | % | *mg.* | *mg./100 gm.* |
| Cooking method | 3 | 3.62 | 41.45* | — | — | 0.60 | 2.69 | 1.34 | 3.83 | 0.0023 | 2.27 | — | — |
| Replicates study | 3 | 34.71** | 13.51 | — | — | 94.72** | 1629.20** | 37.72** | 36.17** | 0.0087 | 293.68** | — | — |
| Error (pooled) | 9 | 4.61 | 8.27 | — | — | 0.85 | 3.10 | 0.36 | 1.06 | 0.007 | 3.31 | — | — |
| **Pork Roasts** | | | | | | | | | | | | | |
| Cooking method | 3 | 1.96 | — | 68.85 | 18.21 | 5.97** | — | 8.94* | — | no significant differences | — | — | — |
| Replicates study | 3 | 9.17 | — | 80.09 | 10.98 | 27.06** | — | 98.20** | — | | — | — | — |
| Error (pooled) | 9 | 5.16 | — | 55.06 | 7.29 | 0.30 | — | 1.35 | — | | — | — | — |
| **Pork Chops** | | | | | | | | | | | | | |
| Cooking method | 3 | 66.22 | — | — | 16.03 | 1.55 | — | 16.93** | — | 0.1603** | — | 0.0135 | 0.1131 |
| Replicates study | 3 | 44.83 | — | — | 35.82* | 60.28** | — | 34.52** | — | 1.2820** | — | 0.2343** | 0.3158** |
| Error (pooled) | 9 | 21.82 | — | — | 5.99 | 1.22 | — | 1.63 | — | 0.01 | — | 0.01 | 0.03 |

*Significant at 5% level
**Significant at 1% level.
†Drip exclusive of fat.

at least some portion of the meat, and thus the thiamine present, may be subjected to higher temperatures than in conventional cooking. Electronic waves penetrate meat relatively rapidly. Heat is produced which results in coagulation of protein and also in formation of steam. Apparently steam is sometimes held in by quickly-coagulated protein until it builds up enough pressure to burst through. "Popping" noises often given off by meat during cooking in an electronic oven and shredding or tearing of tissue sometimes showing up when the meat is sliced makes the above theory seem possible. More rapid heat rise in electronic cooking may be responsible for more rapid thiamine destruction. Numerous studies (2-4, 6-8), including this one, have shown no greater total destruction of thiamine in electronic than in conventional cooking. Studies on the heat pattern in meat during both electronic and conventional cooking are needed.

Only the drip of chops was analyzed for thiamine. Total drip contained significantly less thiamine when chops were cooked in the home electronic oven with browning (0.74 mg.), than when cooked by the other three methods. Evidently the intense heat of the top browning unit was destructive of thiamine in drip, as well as evaporation of drip. Also the pan was not covered while the browning unit was on.

Since differences in the effect of method of cooking on thiamine content per 100 ml. drip (0.86 to 1.00 mg.) were not significant, total thiamine in drip was proportional to amount of drip. Thomas *et al.* (7) found that the amount of drip from beef patties cooked conventionally and electronically had little effect on total amount of thiamine present. Causey *et al.* (2), however, found a greater amount of drip and of thiamine in drip in institutional electronically cooked than in conventionally cooked patties.

The thiamine in 100 ml. drip, exclusive of fat (0.86 to 1.00), was greater than that in 100 gm. of the *l. d. muscle* of the chops on the moist, fat basis, 0.60 to 0.70 mg.

#### REPLICATE STUDIES

Significant differences in the results with patties were to be expected since the proportion of fat to lean meat was not quantitatively controlled. The fat content ranged from 27.5 to 38.7 per cent. Therefore, differences in results in replicate studies of patties are not included in this discussion.

Although differences in the fat, moisture, and thiamine content of the raw meat in replicate studies were not analyzed statistically, certain differences were obvious. The fat content of the *l. d. muscle* ranged, on the different test days, from 2.8 to 6.5 per cent in the roasts and from 2.0 to 6.9 per cent in the chops. Moisture of the *l. d. muscle* ranged from 69.8 to 72.2 per cent in the roasts and from 70.7 to 74.0 per cent in the chops. Thiamine in the raw *l. d. muscle* of the roasts ranged from 2.13 to 2.83 mg. per 100 gm. and that of the chops from 2.32 to 4.59 mg. on the dry, fat-free basis.

Since all of the roasts used on any one day were from one carcass, these ranges may have been due to animal-to-animal differences. The same was true of chops.

Differences were apparently greater in the chops from smaller, less mature animals than in the roasts. The *l. d. muscle* from chops had a lower mean fat content and higher moisture and thiamine contents than that from the roasts.

Differences in the fat and moisture content of the *l. d. muscle* of the cooked roasts and chops were statistically significant at the 5 per cent level, and in thiamine content of the chops at 1 per cent. Since considerable difference in fat, moisture, and thiamine content of the raw meat was observed, some of the difference in the cooked meat may have been due to animal-to-animal difference although normal experimental error in sampling, cooking methods, and analytical procedures may also have been factors.

Significant difference in the shear value of the *l. d. muscle* of the cooked chops also occurred in replicate studies.

In palatability testing, significant differences occurred in juiciness of the *l. d. muscle* of both roasts and chops, in tenderness of roasts, and flavor of fat in chops in replicate studies. These differences could have been due to several factors, including variation in judges' acuity from day to day.

The only significant difference in cooking losses of roasts and chops was in the total drip of chops which probably had no practical significance. Several factors may have had an influence besides animal-to-animal difference. These factors included the varying thicknesses of outer fat (trimming was done subjectively), and the normal experimental error in cooking procedures.

## *Summary*

The following comparisons were made of the quality of pork patties, roasts, and chops: cooking electronically and conventionally; using the "browning unit" in the home electronic oven; cooking in the home electronic oven without browning vs. in the institutional electronic oven (no browning). The heat selector on both electronic ovens was turned to "Low," giving a power output into each oven of approximately 450 watts. The institutional oven was slightly larger.

Conventionally cooking lots of five 100-gm. pork patties (500 gm.), one 3-lb. roast (1361 gm.), and six 1-in.-thick chops (984 gm.) required about five times the cooking time of electronic cooking.

No significant differences due to cooking method in total cooking loss of either patties or roasts occurred. Cooking electronically resulted in significantly less weight loss in chops.

The only obvious difference in over-all appearance of pork cooked by the four methods was surface color: patties, little difference; roasts, small difference; chops, large difference—fat appeared uncooked in the two electronic non-browning methods.

Judges scoring a one-fourth radial section of a patty found no significant difference in any palatability factor; nor did they in scoring the lean of roasts and chops in aroma, color of cut surface, or flavor. In roasts and chops, in which only the *l. d. muscle* was tested, electronic cooking increased juiciness scores for chops, fat content of roasts, and thiamine content of chops, and decreased juiciness and tenderness scores and moisture content of roasts.

Non-browning methods decreased scores for flavor of surface fat of both roasts and chops.

Use of the browning unit in the home electronic oven increased total cooking time, surface browning, aroma, and over-all acceptability of all three forms of pork. Other differences varied with the type of meat. They were: increased cooking loss from chops, fat in drip of roasts, evaporation from patties and chops, flavor of surface fat of roasts and chops, and thiamine in *l. d. muscle* of chops; and decreased fat in drip of patties, fat in *l. d. muscle* of roasts, and moisture in patties.

Differences in the effects of cooking with the home vs. institutional electronic ovens were small.

Replicate studies indicated animal-to-animal difference in fat and moisture content of the raw *l. d. muscle* of both roasts and chops, and thiamine content of the *l. d. muscle* of chops.

## *References*

(1) Bollman, M. C., Brenner, S., Gordon, L. E., and Lambert, M. E.: Application of electronic cooking to large-scale feeding. J. Am. Dietet. A. 24: 1041, 1948.

(2) Causey, K., Andreassen, E. G., Hausrath, M. E., Along, C., Ramstad, P. E., and Fenton, F.: Effect of thawing and cooking methods on palatability and nutritive value of frozen ground meat. 1. Pork. Food Research 15: 237, 1950.

(3) Causey, K., Hausrath, M. E., Ramstad, P. E., and Fenton, F.: Effect of thawing and cooking methods on palatability and nutritive value of frozen ground meat. 2. Beef. 3. Lamb. Food Research 15: 249, 256, 1950.

(4) Causey, K., and Fenton, F.: Effect of reheating on palatability, nutritive value, and bacterial count of frozen cooked foods. 2. Meat dishes. J. Am. Dietet. A. 27: 491, 1951.

(5) Copson, D. A., Neumann, B. R., and Brody. A. L.: High frequency cooking. Browning methods in microwave cooking. J. Agric. & Food Chem. 3: 424, 1955.

(6) Proctor, B. E., and Goldblith, S. A.: Radar energy for rapid food cooking and blanching, and its effect on vitamin content. Food Tech. 2: 95, 1948.

(7) Thomas, M. H., Brenner, S., Eaton, A., and Craig, V.: Effect of electronic cooking on nutritive value of foods. J. Am. Dietet. A. 25: 39, 1949.

(8) Williams, C., Yen, J., and Fenton, F.: Effects of radiation and of cooking on the quality of baby beef liver. Food Research 23: 473, 1958.

(9) Assn. Off. Agric. Chemists: Official Methods of Analysis. 7th ed. Washington, D. C.: Assn. Off. Agric. Chemists, 1950.

(10) Watts, B. M., Peng, D. H., and Esselbaugh, N. C.: The enzymatic extraction of riboflavin from pork for the fluorometer determination. J. Biol. Chem. 172: 707, 1948.

(11) Conner, R. T., and Straub, G. J.: Determination of thiamin by the thiochrome reaction. Indust. & Engin. Chem., Anal. Ed. 13: 389, 1941.

(12) Snedecor, G. W.: Statistical Methods. 5th ed. Ames, Iowa: Iowa State College Press, 1956, chap. 11.

### Guides for Nursing Homes

A set of suggested guides for medical care in nursing homes and related facilities have been developed jointly by the American Nursing Home Association and the Council on Medical Service of the American Medical Association. The Guides, recently approved in final form by both organizations, have been prepared to aid the administrators of nursing homes and homes for the aged in seeing that their patients receive proper medical attention, and to assist physicians in making the best use of such facilities. Among these guides is one relating to nutritional care, as follows:

> "Each nursing home shall consider using consultative services in nutrition and diet therapy provided by the state health department, or by other agencies or persons qualified to perform such service, and should assure that all dietary regimes ordered by the patient's physician are carried out."

Comparative Cost, Palatability, and Ascorbic Acid

# *Cost and Quality of Fresh, Frozen, and Canned Green Beans*[1]

**GWENDOLYN L. TINKLIN and DOROTHY L. HARRISON**

*Department of Foods and Nutrition, Kansas State University, Manhattan*

***These authors have found that cost, grade, or brand alone should not be used to determine the "best buy" in purchasing***

PRESENT MARKETING methods make several types of green beans available to consumers; however, little data have been published on the comparative costs and qualities of the products. In a nation-wide survey, Krehl and Cowgill (1) found that, in general, canned foods were the most economical when cost was calculated on the basis of the edible portion of processed and fresh foods. Guyer and Kramer (2) pointed out that the percentage of seed and fiber in green beans increases with maturity, and Gould (3) reported that maturity was the most important single factor affecting quality. However, nothing on the label of either frozen or canned green beans indicates maturity. Some homemakers have used cost, brand, and/or grade as criteria for judging quality.

To figure relative costs, waste from fresh beans, excessive frost in frozen packages, and liquor in cans must be considered. Consumers must decide, then, which is the "best buy," not only from the standpoint of cost, but also from that of general acceptability, palatability, edible portion, and nutritive value.

This study was designed to compare relative costs and qualities of market beans during a three-year period. Consideration was given to the cost, general acceptability, palatability, drained weight, and ascorbic acid content of fresh beans, two brands of frozen cut beans, and two grades each of canned beans, distributor Grades A and B, and one brand of distributor Grade C canned beans.

## *Experimental Procedure*

All beans were purchased at a local retail market at intervals throughout a three-year period. When fresh, frozen, and canned beans were not all available, fresh and frozen or frozen and canned were obtained. Since costs vary from season to season, the unit cost of each sample was recorded. Duplicate tests were made on each type of product to determine percentages of acceptability, palatability, drained weight, and ascorbic acid content. The results were used as indicators of quality.

### PREPARATION FOR TESTING

After purchasing and before sampling, the fresh beans were weighed, sorted, tipped, snapped, tossed together, and reweighed to determine the waste or percentage of edible solids. Two packages of frozen beans were broken apart, tossed together, and weighed. Samples were weighed from the combined lot of two cans of the same brand and grade of canned beans. Then the contents of each can were drained separately for 1 min., and the weight of solids and the volume of liquid were recorded before the beans from two cans were combined.

### METHODS OF TESTING

*Palatability and Acceptability.* All samples were

[1]Contribution No. 213, Department of Home Economics, Kansas Agricultural Experiment Station, Manhattan. Received for publication June 1, 1959.

[2]The authors wish to express their appreciation to Graduate Research Assistants Mary Ann Peaslee, Ethelind S. Gibson, and Patricia Burton, who did much of the routine laboratory work during this three-year study; and to Dr. H. C. Fryer for technical assistance in the statistical treatment of the data.

**TABLE 1** **Mean cost, acceptability, and palatability scores for fresh, frozen, and canned green beans**

| TYPE OF BEANS | DUPLICATE UNITS | COST OF COOKED SOLIDS | ACCEPT-ABILITY | AROMA* | APPEAR-ANCE* | FLAVOR* | TEXTURE* |
|---|---|---|---|---|---|---|---|
| | | *cents/100 gm.* | % | | | | |
| Fresh | 12 | 6.3 | 89.3 | −0.06 | −0.68 | −0.17 | −0.57 |
| Frozen | | | | | | | |
| Brand 1 | 15 | 8.5 | 60.0 | −0.53 | −0.97 | −1.01 | −1.55 |
| Brand 2 | 15 | 8.2 | 50.4 | −1.02 | −1.21 | −1.48 | −1.62 |
| Canned | | | | | | | |
| Grade A | | | | | | | |
| Brand 1 | 12 | 12.2 | 60.8 | −1.12 | −1.62 | −1.88 | −0.83 |
| Brand 2 | 11† | 5.7 | 19.5 | −1.70 | −2.32 | −2.33 | −1.75 |
| Grade B | | | | | | | |
| Brand 1 | 12 | 8.3 | 33.8 | −1.71 | −2.04 | −2.54 | −1.38 |
| Brand 2 | 12 | 9.5 | 44.3 | −1.50 | −1.60 | −1.93 | −1.25 |
| Grade C | 12 | 4.0 | 12.2 | −2.00 | −2.92 | −3.17 | −2.50 |

*Possible range: 5.0 to −5.0 (very superior to very inferior, with zero as standard).
†Data missing for one duplicate sample.

cooked with minimum liquid and for as short a time as feasible to conserve the nutritive value and the general acceptability of the products (4).

The fresh beans were cooked in a saucepan with the lid tipped slightly so that volatile acids could escape. Samples (100 gm.) were dropped into 100 ml. boiling water containing 1 gm. salt. After 1 min. over a high flame, the flame was lowered to allow the beans to continue boiling until they were "fork tender." Total cooking time varied (12 to 23 min.) with the maturity of the beans.

Frozen beans (100 gm.) were cooked in a covered saucepan with 70 ml. water and 1 gm. salt. The beans were added to the boiling water, covered, and quickly returned to the boil. After cooking 1 min. over a high flame, the beans were cooked over a low flame until "fork tender" (6 to 8 min., depending on the maturity). Canned beans (100 gm.) were heated over a high flame in 60 ml. boiling liquor for 1 min.; then the flame was turned to low, and the beans heated 4 min. longer.

A stainless steel fork was used to lift the beans from the saucepan into numbered, shallow, white china bowls. The bowls were covered with saucepan lids to prevent excess evaporation from the surface and to keep the samples warm until they were judged. An average of six panel members who had had experience in scoring vegetables judged each sample. Each palatability factor was scored within a range of 5.0 to —5.0, very superior to very inferior, with zero as standard. Each judge indicated on a score card whether the product was acceptable for serving. The percentage of judges who considered the product acceptable was considered the percentage acceptability.

*Cooked, Drained Weight, and Ascorbic Acid.* Samples (100 gm.) used to determine the cooked, drained weight and ascorbic acid content of the beans were cooked in the same manner as for the palatability tests. After cooking, each sample was emptied into a large stainless steel sieve and the cooking liquor allowed to drain for 1 min. into a beaker. The drained solids were weighed immediately, and the volume of cooking liquor recorded.

The solids were placed in a Waring Blendor jar with a few drops of butyl stearate. One per cent metaphosphoric acid was added until the jar was one-fourth to one-third full. Samples were blended 5 min., washed into a 1000-ml. volumetric flask with 1 per cent metaphosphoric acid, made up to volume with the acid, and mixed by inverting ten times. Each sample was filtered once through fluted filter paper (#1 Whatman), into a 125-ml. Erlenmeyer flask, and the first few drops of filtrate discarded. The clear filtrate was analyzed for reduced ascorbic acid by a modification of the Loeffler-Ponting method (5).

Before filtering, the cooking liquor was made up to a volume of 200 ml. by diluting with 1 per cent metaphosphoric acid. The clear filtrate was analyzed for reduced ascorbic acid.

*Statistical Analyses.* All data, except those for

**TABLE 2** **Statistical analysis of data in Table 1 on acceptability and palatability**

| COMPARISON | LEAST SIGNIFICANT DIFFERENCE AT THE 5 PER CENT LEVEL | | | | |
|---|---|---|---|---|---|
| | Acceptability | Aroma | Appearance | Flavor | Texture |
| Duplicate units of 11 and 12 | 21.2 | 0.45 | 0.59 | 0.63 | 0.58 |
| Any two duplicate units of 12 | 20.8 | 0.44 | 0.58 | 0.62 | 0.57 |
| Duplicate units of 11 and 15 | 20.2 | 0.43 | 0.56 | 0.60 | 0.55 |
| Duplicate units of 12 and 15 | 19.8 | 0.42 | 0.55 | 0.59 | 0.54 |
| Any two duplicate units of 12 | 19.3 | 0.41 | 0.54 | 0.58 | 0.53 |

**TABLE 3 Mean values for edible solids, liquor, drained weight, and ascorbic acid in fresh, frozen, and canned green beans**

| TYPE OF BEANS | DUPLICATE UNITS | EDIBLE SOLIDS | LIQUOR | COOKED SAMPLE | | ASCORBIC ACID | |
|---|---|---|---|---|---|---|---|
| | | | | Drained weight | Amount of liquor | Solids | Liquor |
| | | *%/unit* | *%/unit* | *gm./100 gm.* | *ml./100 gm.* | *mg./100 gm.* | *mg./100 gm.* |
| Fresh | 12 | 87.2 | — | 99.0 | 58.6 | 5.7 | 1.4 |
| Frozen | | | | | | | |
| Brand 1 | 15 | 100.0 | — | 85.9 | 31.2 | 1.7 | 0.6 |
| Brand 2 | 15 | 100.0 | — | 85.2 | 27.7 | 2.3 | 0.8 |
| Canned | | | | | | | |
| Grade A | | | | | | | |
| Brand 1 | 12 | 50.6 | 49.4 | 90.2 | 35.0 | 1.5 | 0.7 |
| Brand 2 | 12 | 59.1 | 40.9 | 86.7 | 27.7 | 2.0 | 1.0 |
| Grade B | | | | | | | |
| Brand 1 | 12 | 49.9 | 50.1 | 91.2 | 37.9 | 1.6 | 0.7 |
| Brand 2 | 12 | 57.4 | 42.6 | 88.3 | 32.3 | 3.0 | 1.6 |
| Grade C | 12 | 55.7 | 44.3 | 90.1 | 40.0 | 2.5 | 1.3 |

cost, were subjected to analysis of variance. When appropriate, the mean values for the factor being studied were arrayed and analyzed for least significant differences.

## *Results and Discussion*

Analysis of variance of the data indicated significant ($P<.001$) differences attributable to the type of beans with respect to: (a) percentage of acceptability; (b) all of the palatability factors; (c) percentage edible solids and liquor per unit; (d) cooked, drained weight; (e) liquor remaining after cooking; and (f) ascorbic acid.

Least significant differences between mean values were used to compare each product with every other. For most types of beans, there were duplicate units of 12, whereas for other types there were duplicate units of 11 or 15 (Tables 1 to 4). Therefore, when least significant differences were used to compare two products, it was necessary to consider the variation in duplicate units. For example, to compare fresh beans with either brand of frozen beans, it was necessary to consider the least significant difference between units of 12 and 15, whereas to compare any two types of canned beans, except Grade A, Brand 2, the least significant difference for any two units of 12 were used. When comparing Grade A, Brand 2, canned beans with any of the other canned beans, the values for units of 11 and 12 were used.

### COST AND PERCENTAGE ACCEPTABILITY

Mean values for the cost of 100 gm. cooked solids and percentage acceptability of the beans, as well as least significant differences ($P<.05$) for percentage acceptability, are presented in Tables 1 and 2. Cost of the beans was not related directly to acceptability, although Grade C canned beans were the lowest in cost and were significantly less acceptable than any except Grade A, Brand 2 canned beans. Grade A, Brand 1 canned beans were most expensive. However, they were significantly more acceptable than only three of the other canned beans, and rated about the same as the frozen beans and remaining canned beans. Fresh beans cost less than any of the beans except Grade A, Brand 1 and Grade C canned beans, and were significantly more acceptable than all of the other beans.

There was a wide difference in both cost and acceptability of the two brands of Grade A canned beans. Brand 1 beans were approximately twice as expensive and significantly more acceptable than Brand 2. Both Grade B brands and both frozen brands were similar in price, and the differences in acceptability were non-significant (Table 2).

### PALATABILITY

Average scores and least significant differences for aroma, appearance, flavor, and texture of the beans are given in Tables 1 and 2. Fresh beans were the most palatable, and Grade C canned beans the least. In general, frozen beans and Grade A, Brand 1 canned beans ranked next to the fresh beans. Grade A, Brand 2 and the two brands of Grade B canned beans were still less palatable.

**TABLE 4 Statistical analysis of data in Table 3 on edible solids, liquor, drained weight, and ascorbic acid**

| COMPARISON | LEAST SIGNIFICANT DIFFERENCE AT THE 5 PER CENT LEVEL | | | | | |
|---|---|---|---|---|---|---|
| | Edible solids | Liquor | Cooked sample | | Ascorbic acid | |
| | | | Drained weight | Amount of liquor | Solids | Liquor |
| Any two duplicate units of 12 | 3.0 | 3.7 | 2.5 | 5.8 | 0.9 | 0.4 |
| Duplicate units of 12 and 15 | — | — | 2.4 | 5.5 | 0.8 | 0.4 |
| Any two duplicate units of 15 | — | — | 2.2 | 5.2 | 0.8 | 0.3 |

*Aroma.* Aroma scores for fresh beans were significantly better than those for any of the other beans. The first brand of frozen beans was scored significantly better in aroma than the second and all of the canned beans. Brand 2 of the frozen beans were scored significantly better than all canned beans except Grade A, Brand 1. Aroma scores for Grade A, Brand 2 and both brands of Grade B canned beans were not significantly different from each other. Grade C canned beans were significantly poorer in aroma than all beans except Grade A, Brand 2 and Grade B, Brand 1. Aroma scores for Grade A, Brand 1 were significantly better than those for the second brand of Grade A canned beans. However, the differences in aroma scores for the two Grade B brands were not significant.

*Appearance.* The appearance of the fresh beans was significantly better than that of the canned, but no better than for the frozen. The two brands of frozen beans were not significantly different from each other in appearance. However, the first brand scored significantly better than all beans except fresh and the second brand of frozen beans, whereas this brand scored significantly better than only Grade A, Brand 2; Grade B, Brand 1; and Grade C. Grade A, Brand 1 and Grade B, Brand 2 beans scored significantly better than Grade A, Brand 2 and Grade C beans. The latter were significantly poorer in appearance than all other beans. Grade A, Brand 1 beans scored significantly better in appearance than the other Grade A brand, whereas there were no significant differences between the two brands of Grade B beans.

*Flavor.* The fresh beans ranked significantly better in flavor than all other beans. The two brands of frozen beans were not significantly different in flavor, but Brand 1 was significantly better than all except the fresh beans, and Brand 2 was significantly better than Grade A, Brand 2; Grade B, Brand 1; and Grade C canned beans. Grade A, Brand 1 beans were significantly better than Grade B, Brand 1 and Grade C, whereas Grade C was significantly poorer in flavor than all others. There were no significant differences between the two brands of either Grade A or Grade B.

*Texture.* Fresh beans were significantly better in texture than all but Grade A, Brand 1 canned beans, whereas the latter were significantly better than Grade A, Brand 2 canned beans and both frozen brands. The two frozen brands were not significantly different in texture and were significantly better than Grade C canned beans only. The differences in texture between the two Grade B brands of canned beans were not significant.

### EDIBLE SOLIDS AND LIQUOR

The percentage of edible solids and liquor per unit of each type of bean are presented in Table 3. There was no waste with the frozen beans, because the frozen block was broken apart, weighed, and the samples cooked without thawing. Canned beans had the least edible solids per unit, with fresh beans ranking between the frozen and canned products. Fresh beans had approximately 28 to 37 per cent more edible solids per unit than canned beans. On the average Brand 1 of both Grade A and B canned beans had a significantly higher percentage of liquor per unit and a significantly lower percentage of edible solids than the other canned beans (Table 4). Also, there were significant differences in percentage of edible solids and liquor per unit between the two Grade A brands and the two Grade B brands.

*Cooked, Drained Weight and Cooking Liquor.* Mean values for the drained weight of cooked samples and the liquor remaining after cooking are given in Table 3. The drained weight for fresh beans was significantly higher than that for any of the others (Table 4). Perhaps the moisture-retaining quality of the fresh beans was greater. The drained weight of both brands of cooked frozen beans was significantly less than that of all the others except Grade A, Brand 2 canned beans. The frost collected in the package of frozen beans was included in the original 100-gm. sample and was reflected in the cooked, drained weight. There were significant differences in drained weight between the two brands within both Grades A and B canned beans. The cooked, drained weight of Grade C canned beans was not significantly different from that of three of the other four brands.

In general, the amount of liquor that remained after cooking followed the same pattern as the data for cooked, drained weight.

### ASCORBIC ACID

Mean values for the ascorbic acid in the solids (Table 3) are considered to represent the ascorbic acid content of the beans. The amount of ascorbic acid in the liquor was small, and the liquor usually is not served. The fresh beans contained significantly more ascorbic acid than any of the other beans (Table 4). Grade B, Brand 2 canned beans ranked second in ascorbic acid and contained significantly more than either Grade A brand or Grade B, Brand 1 canned beans and Brand 1 frozen beans. Grade C canned beans and Brand 2 frozen beans contained approximately the same amount of ascorbic acid. Grade C beans ranked significantly above Brand 1 of both Grades A and B canned beans and Brand 1 frozen beans. Brand 2 frozen beans ranked significantly above only Grade A, Brand 1 canned beans, the product with the least ascorbic acid.

No significant differences in ascorbic acid occurred between the two brands of frozen beans or between the two brands of Grade A beans. However,

there were significant differences in ascorbic acid between the two brands of Grade B canned beans.

All values for ascorbic acid were lower than most of those found elsewhere in the literature. Length of storage time is known to influence the ascorbic acid present and could have been a factor. There was no way of knowing how fresh the so-called "fresh beans," the frozen, or canned beans might have been, since they all were purchased from the counter of a local market at different seasons of the year.

## *Summary and Conclusions*

The relative cost and quality of market beans (fresh, frozen, and three grades of canned beans) were studied over a period of three years. There were significant ($P<.001$) differences in percentage acceptability; palatability; percentage of edible solids and liquor per unit; cooked, drained weight; liquor remaining after cooking; and ascorbic acid which were attributable to the type of beans.

Fresh beans were among the lowest in cost, were acceptable a greater percentage of time, were more palatable, and contained more ascorbic acid than any of the other beans. One brand of Grade A canned beans was the most expensive and was rated high in percentage acceptability and palatability, but contained the least ascorbic acid. A second brand of Grade A canned beans was among the lowest in cost, but also ranked low in percentage acceptability, palatability, and ascorbic acid content.

Grade B canned beans were in the intermediate range in cost, percentage acceptability, and palatability. One brand of Grade B beans contained more ascorbic acid than all except the fresh beans, whereas the other Grade B brand was among the lowest in ascorbic acid. Grade C canned beans were lower in cost, percentage acceptability, and palatability than any of the beans, but contained more ascorbic acid than most of the canned and frozen beans.

Brand made less difference with frozen beans than with canned beans. Frozen beans were in the intermediate group in cost and percentage acceptability and ranked high in all palatability factors except texture.

It was concluded that cost, grade, or brand should not be used alone to determine the quality of green beans.

## *References*

(1) KREHL, W. A., AND COWGILL, G. R.: Comparative cost and availability of canned, glassed, frozen, and fresh fruits and vegetables. J. Am. Dietet. A. 26: 168, 1950.

(2) GUYER, R. B., AND KRAMER, A.: Studies of Factors Affecting the Quality of Green and Wax Beans. Md. Agric. Exper. Sta. Bull. A68, 1952.

(3) GOULD, W. A.: Quality Evaluation of Fresh Frozen, and Canned Snap Beans. Ohio Agric. Exper. Sta. Res. Bull. 701, 1951.

(4) TEPLY, L. J., AND DERSE, P. H.: Nutrients in cooked frozen vegetables. J. Am. Dietet. A. 34: 836, 1958.

(5) LOEFFLER, H. J., AND PONTING, J. D.: Ascorbic acid. Rapid determination in fresh, frozen or dehydrated fruits and vegetables. Indust. & Engin. Chem., Anal. Ed. 14: 846, 1942.

### *Plant Extracts May Be Possible Cancer Fighters*

Ninety-six naturally occurring plant extracts, obtained from ninety-one species, have "anti-cancer possibilities," according to Usha C. Dalal, Alfred Taylor, and George F. McKenna, University of Texas School of Medicine. Extracts from thirty-two species inhibited growth of egg-cultivated tumors by 55 to 100 per cent as compared with water-treated controls. Five species in the legume family, including the sweet locust and the white popinac, gave extracts which inhibited tumor growth 63 to 95 per cent. The next greatest inhibition, 67 to 90 per cent, came from the *Anacardiaceae* family, which includes the pistachio nut tree. Extracts from the *Compositae* family inhibited tumor growth 55 to 70 per cent. Plants tested in this group included the bur-marigold, plumed thistle, climbing hempweed, and rosinweed. Cherry palm, forsythia, cypress pine, soap berry, Japanese persimmon tree, and Indian or mock strawberry also yielded tumor-inhibiting extracts.

However, the scientists warn, "None of the plant extracts processed to date have given results which promise practical application to cancer chemotherapy." As yet, they point out, there is not a "single chemical agent which will completely inhibit the growth or destroy tumor tissue without causing undue disturbances to nontumor tissue." Since plants have given potent medicines for other diseases, the researchers feel they may be useful in cancer therapy.

The report appeared last winter in *Texas Reports on Biology and Medicine*, published by the University's Medical Branch.

# *Heat Transfer in White Sauce Cooled in Flowing Water*[1]

**LENORA MORAGNE, KARLA LONGRÉE, Ph.D. and JAMES C. WHITE, Ph.D.**

*Departments of Institution Management and Dairy Industry, Cornell University, Ithaca, New York*

UNLESS FOODS are adequately preserved during preparation and storage, the danger of food poisoning exists. Bacteria or their products are responsible for the majority of the outbreaks of food-borne illnesses reported in the literature. For food-poisoning bacteria, the temperature range of optimal growth and toxin production has been reported as 115° to 60°F. When food is held 4 to 5 hr. at this temperature, the bacteria have sufficient time for abundant growth. To assure a safe margin, the temperature zone of 120° to 50°F. has been accepted as the "danger zone" of bacterial multiplication (1). Since it is practically impossible to exclude completely the entrance of food-poisoning organisms, it seems most logical to assure temperature conditions within the food medium that will be unfavorable for bacterial multiplication.

Research has shown that warm cooked foods held and stored in large quantities have slow cooling rates, with the temperature of the mass consequently remaining in the zone for optimal bacterial growth over a long period of time (2-6).

Too often refrigerated space is far from adequate and foods are allowed to cool at room temperature, or, foods are refrigerated in large batches creating conditions preventing quick cooling. Also, overloading a refrigerator with warm food may slow the cooling process since it causes the refrigerator temperature to rise unduly (4); chances for bacterial growth are thus increased in foods "refrigerated" under these conditions. The need for effective precooling methods for proper storage of large batches of food is therefore obvious.

This investigation is concerned with the precooling of large batches of white sauce in flowing cold water contained in an institution bain-marie. The aim was: (a) to gain information on the heat transfer in the white sauce precooled in this manner and (b) to study several selected factors influencing the total cooling time of the sauces.

In the preliminary study, the total cooling time of white sauce as influenced by the position of the stock pots containing the sauce in the bain-marie was determined, as well as the method of preparation, viscosity, batch size, and agitation of the sauce. (Agitation is effectively used by the canning industry as an aid in heat distribution [7].)

## *Experimental Procedure*

The purposes of the main study were to determine the drop in temperature after various cooling periods and the total cooling time of white sauce prepared in quantity, as influenced by:

(a) The temperature of the water used as the coolant (35°, 42°, and 70°F.).

(b) The rate of water flow into the bain-marie (fast and slow).

(c) The batch size of the white sauce (2 and 4 gal.).

(d) The viscosity of the white sauce (high and low).

(e) The interval between agitating the sauce (15 and 30 min.).

The general plan of the investigation was to carry out three experiments using cold tap water at three temperatures as the coolant. Each experiment was carried out over a period of eight days. On each day, flow of coolant, batch size, and sauce viscosity were paired, agitation interval being the only varying factor. The intervals were 15 min. and 30 min.

[1]Reported from the unpublished master's thesis of Lenora Moragne. This is part of a larger project, "The Effect on Bacterial Counts of Holding, Refrigerating, and Freezing Cooked Foods Prepared in Quantity." Received for publication June 8, 1959.

The first experiment was carried out in the fall when the cold tap water temperature was 42°F. The second experiment was conducted in the summer when the cold tap water was at a temperature of 70°F. In the third experiment, water at a temperature of 35°F. was used. A portable refrigeration unit was designed and installed to supply water of that temperature. The detailed plan of the eight days is apparent in Table 2.

EQUIPMENT

A stainless steel bain-marie, equipped with a cold tap water supply, was used for the water bath. The dimensions of the bain-marie were 48 by 24 in. by 10 in. An overflow drain located 5½ in. from the floor of the bain-marie permitted a water bath depth of approximately 5½ in. Steam pipes in the bottom of the bain-marie served as a false bottom under the stock pots; thus, the actual water bath depth surrounding the stock pots was 5 in.

Cold tap water flowed into the bain-marie at a "slow rate" of 0.1 cu. ft. per minute, or at a "fast rate" of 0.6 cu. ft. per minute. A water meter[2] was installed in the cold tap water line to measure the water inflow.

The refrigerated water was pumped from the tank into the bain-marie. The practicality of producing refrigerated water with a unit of this particular construction was not considered at this time, since the unit simply served the purpose of providing water of a temperature needed to demonstrate the principle of cooling under low temperature conditions.

Heavy-duty cast aluminum stock pots[3] of 25-qt. capacity were used as containers for the white sauce. The stock pots were 13 in. high and 12 in. in diameter.

MATERIALS

A quantity white sauce mix was used as the food medium (8). Each day the amount of sauce of specified viscosity was prepared from the mix in a hot water bath. The "low viscosity" sauce was a thin-medium, and the "high viscosity" sauce a thick-medium sauce.

METHODS

In the preliminary study several methods of agitating the warm white sauce were investigated. Various stirring techniques were compared; the utensils used for agitation were a stainless steel spoon, a wire whip, and a milk-stirring disk.

In the main study, a complete-circle agitation technique employing a wire whip was used. The white sauce was agitated completely around the bottom inside circumference of the stock pot; however, rather than a sweeping movement around the pot, the whip was lifted up through the sauce at eight equidistant points around the inside wall of the pot.

A check on the relative viscosity of the white sauce was made by measuring the linespread of the sauce (9). The measurement was taken at the beginning of each cooling period. Values for the radius of spread of the low-viscosity sauce ranged from 39.5 to 47.5 mm. and of the high-viscosity sauce from 17.5 to 27.2 mm. The preliminary studies had indicated only slight differences in the viscosities of the agitated and non-agitated sauces.

Temperature was recorded on a Brown Electronik potentiometer.[4] Two types of copper constantan thermocouples were used: general purpose, headpencil type and glass shield; the latter thermocouples were made in the laboratory. Temperatures were determined in two locations of the warm medium, at 1½ in. from the surface of the medium and at 1½ in. from the bottom of the stock pot. A wooden frame forming a bridge across each stock pot from one handle to the other held the thermocouples in position. The thermocouples were removed from the medium just before each agitation and replaced at the completion of the procedure. Temperature recordings were made in the warm medium continually from an initial temperature of 140°F. to a final temperature of 60°F.

The position of the thermocouples in relation to the water bath level varied. With 4-gal. batches of sauce, the thermocouple positioned 1½ in. from the surface of the medium was located 2 in. above the surface level of the coolant; the thermocouple positioned 1½ in. from the bottom of the stock pot was located 3½ in. below the level of the coolant. When 2 gal. sauce were contained in the stock pot, all of the thermocouples were below the surface level of the coolant. The thermocouples positioned 1½ in. from the surface of the medium were located 2¾ in. below the surface of the coolant; and the thermocouple positioned 1½ in. from the bottom of the stock pot was located 3½ in. below. A record of the temperature of the water bath was also made at the inlet and the outlet of the bain-marie each day.

STATISTICAL ANALYSIS OF RESULTS[5]

An explanation of the statistical procedure employed is in order. The investigation included a single replicate of a split-split-plot experiment, with the temperature (T) of the coolant as whole plots; combinations of batch size (B), viscosity (V), and rate of flow (R) as sub-plots; and agitation (A) as

[2]Neptune.
[3]Wearever.
[4]Minneapolis-Honeywell.
[5]The authors wish to express their sincere thanks to Wallace R. Blischke, Graduate Assistant, Department of Plant Breeding, Biometrics Unit, for his assistance in the statistical analysis of these results.

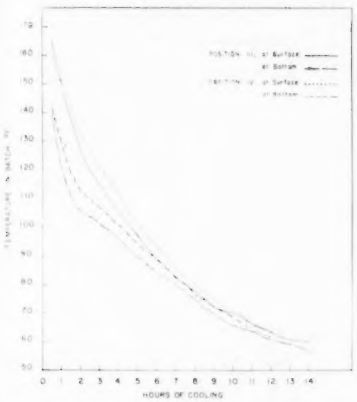


FIG. 1. *Cooling curves of two 4-gal. batches of low-viscosity white sauce in 25-qt. stock pots. Cold water flowed into the bain-marie at the slow rate.*

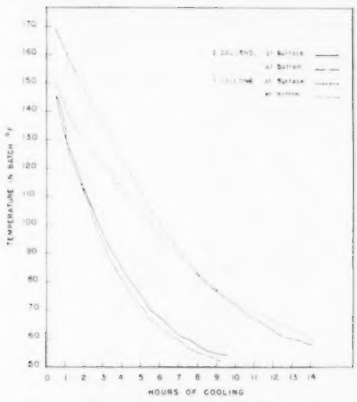


FIG. 2. *Cooling curves of two 4-gal. batches of white sauce in 25-qt. stock pots; one batch of low viscosity, one batch of high viscosity. Cold water flowed into the bain-marie at the slow rate.*

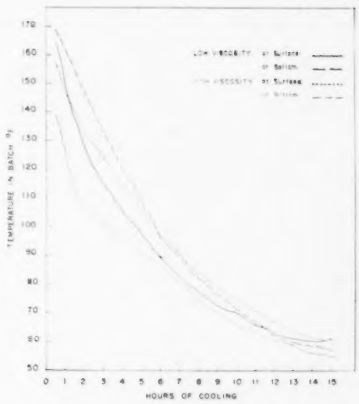


FIG. 3. *Cooling curves of two batches of low-viscosity white sauce in 25-qt. stock pots; one 2-gal. batch and one 4-gal. batch. Cold water flowed into the bain-marie at the slow rate.*

sub-sub-plots. Since it was known *a priori* that temperature effects do exist, the null hypothesis that temperature effects are zero was not tested. Thus we need only estimate the sub-plot and sub-sub-plot errors, $\sigma_b^2$ and $\sigma_c^2$ respectively. Since this study involved only a single replicate, there were no known estimates of these errors from prior information concerning the magnitude of the higher order interactions, or at least concerning the magnitude of these interactions relative to the other possible effects.

It was not assumed *a priori* that the four- and five-factor interactions would be non-existent or negligible. It is very unusual for four-factor interactions to be important, and even more unusual for five-factor interactions. To make a start on the problem, it was assumed that the five-factor interaction was non-existent. Thus the mean square for this effect is an estimate of $\sigma_c^2$, having two degrees of freedom. A more precise estimate of $\sigma_c^2$, i.e., an estimate with more degrees of freedom, is desirable. To this end, a method investigated by Bozivich *et al.* (10) was applied to determine whether pooling the four-factor interactions—ATRB, ATRV, ATBV, and ARBV—with the five-factor interaction to estimate $\sigma_c^2$ can be justified.

The procedure in this case was to test each "doubtful error" (four-factor interaction) against the "known estimate of error" and to pool if the computed F were less than the appropriate tabulated F at the 25 per cent level. It is found that

$$\frac{\text{MS(ATBV)}}{\text{MS(ATRBV)}}=\frac{119.44}{104.10}=1.147;$$

$$\frac{\text{MS(ATRV)}}{\text{MS(ATRVB}}=\frac{7.03}{104.10}<1;$$

$$\frac{\text{MS(ATRB)}}{\text{MS(ATRBV)}}=\frac{61.24}{104.10}<1.$$

All are less than $F_{.25}(2,2df)=3.00$. Furthermore,

$$\frac{\text{MS(ARBV)}}{\text{MS(ATRBV)}}=\frac{43.29}{104.10}<1;<F_{.25}(1,2df)=2.57.$$

Thus, the pooling of these five mean squares to estimate $\sigma$ is justified.

$$E_c=\frac{122.47+14.06+238.88+208.19+43.29=69.95}{2+2+2+2+1}$$

The mean square 69.65 is then an appropriate error for testing hypotheses about sub-sub-plot treatments (agitation) and all interactions of sub-sub-plot treatments with sub-plot treatments and whole plot treatments.

It will further be assumed that the interaction TRBV does not exist, so that the mean square for this effect is an estimate of the sub-plot error, $\sigma_b^2$, i.e., an appropriate error for testing all other effects, excluding temperature. However, it is important to note that $\text{MS(TRBV)} = 47.56 < 69.65 = E_c$. Since with this experimental design such a relationship exists among the true variances, $\sigma_b^2$ and $\sigma_c^2$, only under special circumstances, e.g., competition, can it be concluded that the sub-plot and sub-sub-plot errors are probably very nearly the same. Thus it is felt that, in this case, the ignoring of the restrictions or randomization inherent in the split-split-plot design may be justified. Therefore, MS(TRBV) was pooled with $E_c$ to obtain $\frac{95.11+626.89}{2+9}=65.636$, with eleven degrees of freedom, as an error appropriate for testing hypotheses about all effects with the exception of temperature.

## *Results and Discussion*

Results of the preliminary studies indicated that: (a) the contents of each stock pot in Position III

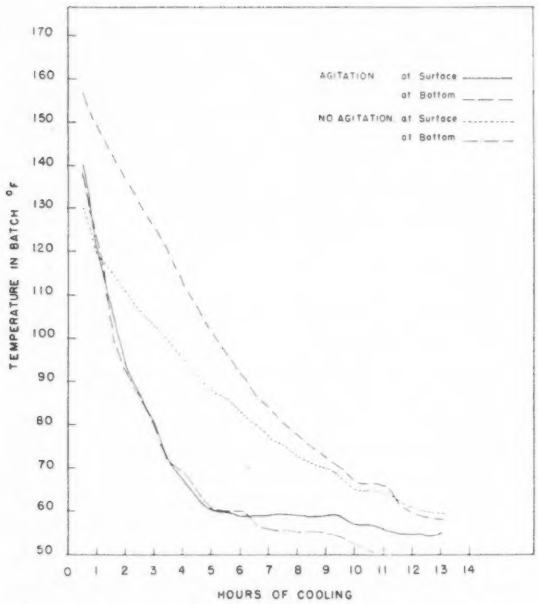



FIG. 4. *Cooling curves of two 4-gal. batches of low-viscosity white sauce; one batch agitated and one not agitated. Cold water flowed into the bain-marie at the slow rate.*

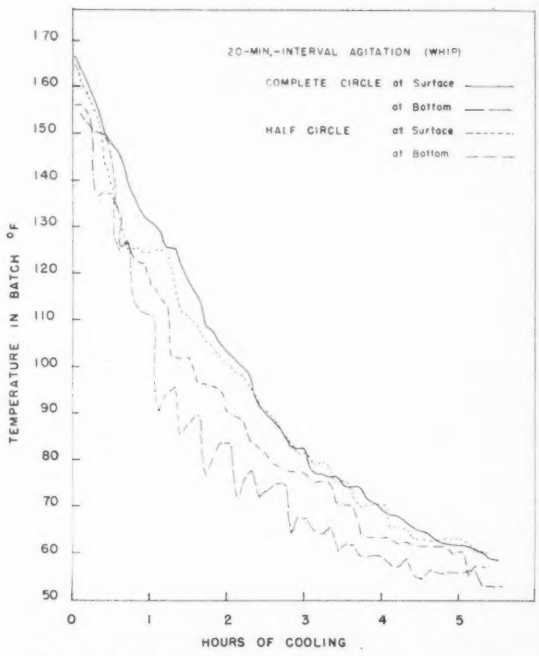



FIG. 5. *Cooling curves of two 4-gal. batches of low-viscosity white sauce, agitated with a wire whip at 20-min. intervals. Cold water flowed into the bain-marie at the slow rate.*

of the bain-marie produced comparable total cooling times (Figure 1); (b) the viscosity and the batch size of the sauce influenced the total cooling time (Figures 2 and 3); (c) agitation *per se* decreased the total cooling time considerably (Figure 4); and (d) agitation technique influenced the total cooling time (Figure 5).

Results of the main study are presented in Tables 1 and 2. Mean squares and F values for the sources of variation are presented in the analysis of variance (Table 1). The statistical analysis was made on the total cooling time of the sauces cooled from 140°F. to 80°F. The temperature drops within the sauces after various periods of cooling are given in Table 2. Some sauces were allowed to cool from an initial temperature of 140°F. to a final temperature of 60°F. (Table 2); others, from an initial temperature of 140°F. to a final temperature of 80°F. (Table 2).

### TEMPERATURE OF COOLING WATER

All interactions significant at the 1 and 5 per cent levels involved temperature (T) (Table 1). A graphic presentation of these significant interactions involving temperature (T) is presented in Figure 6.

These results indicated that the rate of heat transfer increased as the temperature of the cooling water decreased from 70°F. to 35°F. With a coolant temperature of 35°F., all batches cooled to 60°F. within 4 hr. 40 min. When the water temperature was 42°F., the maximum total cooling time to 60°F. was 6 hr. 30 min. and the minimum was 2 hr. 50 min. With a water-bath temperature of 70°F., the sauces rarely cooled to temperatures below 75°F. It should be remembered that the recommended time for holding warm food within the "danger zone" of 115° to 60°F. is 4 to 5 hr. (1). In the 4-gal. batches, only with the use of refrigerated water of 35°F. were the total cooling times sufficiently reduced to approach this goal. In the 2-gal. batches, cooling within less than 4 to 5 hr. was achieved with the use of water at 42°F. also.

For practical considerations, it should be pointed out that a refrigeration unit installed to supply cold water might be constructed so that the water can be recirculated and consequently the consumption of water would be kept at a minimum.

### RATE OF WATER FLOW

The fast rate of water flow produced shorter total cooling times than the slow rate. In cooling the high-viscosity sauce, this difference was outstanding, especially when cooling in a water bath of 35°F. (Figure 6, A and B).

At the fast rate of flow, approximately 4½ gal. water per minute were consumed, while at the slow rate, the quantity consumed per minute was only ¾ gal. The need for a large quantity of water to do an efficient job of cooling is a further point to be

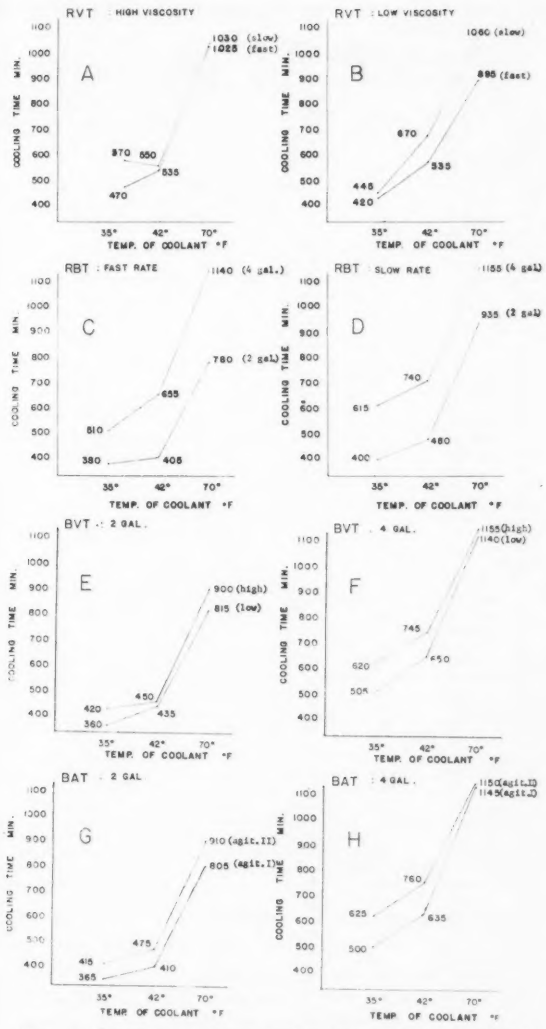



FIG. 6. *Significant three-factor interactions involved as sources of variations in the total cooling time of the white sauce. Section G indicates significances at the 1 per cent level; all other sections, significance at the 5 per cent level.*

considered in favor of an arrangement that will recirculate the water during the cooling process.

BATCH SIZE OF SAUCE

In agreement with results reported in the literature, cooling of the small batches of sauce gave faster cooling rates and shorter total cooling times than the cooling of the large batches. The influence of batch size on the rate of heat transfer was the most significant single factor. Interactions involving batch size (B) are presented graphically in Figure 6, C–H.

Now that the significant influence of small batch size on precooling has been determined, the effect of the distribution of the precooled load in a refrigerator needs to be investigated: namely, the effect on refrigerator temperatures of distributing the total load into numerous small batches vs. the total load distributed into fewer large batches.

**TABLE 1 Mean squares and F values for the sources of variation**

| SOURCE OF VARIANCE | DEGREES OF FREEDOM | MEAN SQUARE | F VALUE |
|---|---|---|---|
| R† | 1 | 4313.00 | 65.71** |
| B‡ | 1 | 42900.40 | 653.57** |
| V# | 1 | 3088.00 | 47.04** |
| A¶ | 1 | 4700.40 | 71.61** |
| RB | 1 | 42.34 | <1 |
| RV | 1 | 42.24 | <1 |
| RA | 1 | 88.18 | 1.34 |
| BV | 1 | 88.18 | 1.34 |
| BA | 1 | 25.78 | <1 |
| VA | 1 | 42.34 | <1 |
| RT | 2 | 34.93 | <1 |
| BT | 2 | 909.93 | 13.86** |
| VT | 2 | 103.63 | 1.58 |
| AT | 2 | 113.08 | 1.72 |
| RBT | 2 | 820.26 | 12.50** |
| RVT | 2 | 1482.81 | 22.59** |
| RAT | 2 | 37.89 | <1 |
| BVT | 2 | 403.64 | 6.15* |
| BAT | 2 | 587.94 | 8.96** |
| VAT | 2 | 10.93 | <1 |
| RBV | 1 | 187.62 | 2.86 |
| RBA | 1 | 116.75 | 1.78 |
| RVA | 1 | 187.62 | 1.64 |
| BVA | 1 | 0 | <1 |
| Error | 11 | 65.64 | |

*Significant at the 5% level.
**Significant at the 1% level.
†Rate
‡Batch size.
#Viscosity.
¶Agitation.

VISCOSITY OF SAUCE

Throughout the investigation, the low-viscosity sauce cooled at a faster rate than the high-viscosity sauce. It was interesting to note that the effect of viscosity was greatest when water at a temperature of 35°F. was used. The interaction of temperature (T) with viscosity (V) was considerably different in the 2-gal. batches of sauce than in the 4-gal. batches (Figure 6, E and F).

Jakob (11) emphasizes that the viscosity of the cooled medium influences all forms of heat transfer. The influence of viscosity points out the need for efficient cooling methods when dealing with the more viscous foods.

AGITATION OF SAUCE

The preliminary study indicated that differences in cooling rates of agitated batches of sauce vs. non-agitated batches of sauce were great. In a flowing, cold-water bath at a temperature of 42°F., non-agitated 4-gal. batches of the sauce cooled from 140°F. had not reached 60°F. after 12 hr. cooling while agitated batches had cooled to 60°F. before 5 hrs. had elapsed. For this reason, agitation *per se* was not selected as a factor in the main investiga-

**TABLE 2 Temperature drop in and total cooling time of 4-gal. batches of white sauce in water of 35°, 42°, and 70°F. flowing in a bain-marie**

| DAY | RATE OF COLD WATER FLOW | BATCH SIZE | VISCOSITY OF SAUCE | AGITATION INTERVAL | LOCATION OF THERMOCOUPLE IN BATCH* | TEMPERATURE DROP FROM 140°F. | | | | TOTAL COOLING TIME FROM 140° to 80°F. | | TOTAL COOLING TIME FROM 140° to 60°F. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | After ½ hr. | After 1 hr. | After 2 hr. | After 3 hr. | | | | |
| **Flowing Water at 35°F.†** | | | | | | | | | | | | | |
| | | *gal.* | | *min.* | | °F. | °F. | °F. | °F. | *hr.* | *min.* | *hr.* | *min.* |
| 1 | Slow | 2 | low | 15 | surface | 34 | 47 | 72 | 85 | 1 | 20 | 2 | 25 |
| | | | | | bottom | 36 | 46 | 72 | 85 | | | | |
| | Slow | 2 | low | 30 | surface | 35 | 47 | 68 | 81 | 1 | 30 | 2 | 55 |
| | | | | | bottom | 36 | 47 | 68 | 84 | | | | |
| 2 | Slow | 2 | high | 15 | surface | 27 | 44 | 68 | 80 | 1 | 50 | 3 | |
| | | | | | bottom | 27 | 45 | 68 | 78 | | | | |
| | Slow | 2 | high | 30 | surface | 13 | 42 | 63 | 78 | 2 | | 3 | 15 |
| | | | | | bottom | 20 | 42 | 68 | 85 | | | | |
| 3 | Slow | 4 | low | 15 | surface | 30 | 41 | 64 | 76 | 2 | | 3 | 45 |
| | | | | | bottom | 27 | 40 | 64 | 75 | | | | |
| | Slow | 4 | low | 30 | surface | 21 | 37 | 57 | 70 | 2 | 35 | 4 | 40 |
| | | | | | bottom | 21 | 34 | 55 | 69 | | | | |
| 4 | Slow | 4 | high | 15 | surface | 17 | 34 | 54 | 66 | 2 | 35 | 4 | 25 |
| | | | | | bottom | 19 | 33 | 57 | 68 | | | | |
| | Slow | 4 | high | 30 | surface | 21 | 29 | 51 | 63 | 3 | 5 | 5 | 10 |
| | | | | | bottom | 13 | 32 | 45 | 62 | | | | |
| 5 | Fast | 2 | low | 15 | surface | 29 | 51 | 75 | | 1 | 35 | 2 | 40 |
| | | | | | bottom | 28 | 48 | 76 | | | | | |
| | Fast | 2 | low | 30 | surface | 20 | 47 | 70 | | 1 | 35 | 2 | 40 |
| | | | | | bottom | 21 | 46 | 71 | | | | | |
| 6 | Fast | 2 | high | 15 | surface | 27 | 49 | 74 | | 1 | 20 | 2 | 25 |
| | | | | | bottom | 25 | 49 | 78 | | | | | |
| | Fast | 2 | high | 30 | surface | 24 | 60 | 65 | | 1 | 50 | 2 | 45 |
| | | | | | bottom | 24 | 45 | 72 | | | | | |
| 7 | Fast | 4 | low | 15 | surface | 35 | 51 | 74 | 86 | 1 | 40 | 2 | 40 |
| | | | | | bottom | 35 | 53 | 74 | 88 | | | | |
| | Fast | 4 | low | 30 | surface | 29 | 45 | 66 | 78 | 2 | 10 | 2 | 35 |
| | | | | | bottom | 35 | 46 | 67 | 81 | | | | |
| 8 | Fast | 4 | high | 15 | surface | 26 | 42 | 62 | 76 | 2 | 5 | 3 | 40 |
| | | | | | bottom | 28 | 44 | 62 | 79 | | | | |
| | Fast | 4 | high | 30 | surface | 20 | 35 | 58 | 72 | 2 | 35 | 4 | 15 |
| | | | | | bottom | 16 | 38 | 60 | 70 | | | | |
| **Flowing Water at 42°F.‡** | | | | | | | | | | | | | |
| 1 | Slow | 2 | low | 15 | surface | 24 | 42 | 67 | 79 | 1 | 40 | 3 | 20 |
| | | | | | bottom | 28 | 39 | 68 | 79 | | | | |
| | Slow | 2 | low | 30 | surface | 23 | 40 | 66 | 74 | 2 | | 3 | 55 |
| | | | | | bottom | 25 | 47 | 66 | 77 | | | | |
| 2 | Slow | 2 | high | 15 | surface | 16 | 36 | 59 | 72 | 2 | 5 | 3 | 35 |
| | | | | | bottom | 15 | 35 | 59 | 75 | | | | |
| | Slow | 2 | high | 30 | surface | 12 | 32 | 60 | 75 | 2 | 15 | 3 | 50 |
| | | | | | bottom | 11 | 30 | 58 | 73 | | | | |
| 3 | Slow | 4 | low | 15 | surface | 23 | 38 | 55 | 66 | 2 | 30 | 5 | 30 |
| | | | | | bottom | 22 | 32 | 54 | 66 | | | | |
| | Slow | 4 | low | 30 | surface | 17 | 35 | 52 | 61 | 3 | | 6 | |
| | | | | | bottom | 16 | 29 | 51 | 61 | | | | |
| 4 | Slow | 4 | high | 15 | surface | 14 | 33 | 49 | 61 | 3 | 10 | 6 | |
| | | | | | bottom | 17 | 24 | 47 | 61 | | | | |
| | Slow | 4 | high | 30 | surface | 9 | 30 | 44 | 56 | 3 | 40 | 6 | 30 |
| | | | | | bottom | 6 | 19 | 43 | 55 | | | | |
| 5 | Fast | 2 | low | 15 | surface | 15 | 39 | 67 | 81 | 1 | 35 | 2 | 50 |
| | | | | | bottom | 15 | 40 | 67 | 81 | | | | |
| | Fast | 2 | low | 30 | surface | 11 | 34 | 60 | 76 | 2 | | 3 | 15 |
| | | | | | bottom | 10 | 33 | 60 | 75 | | | | |
| 6 | Fast | 2 | high | 15 | surface | 20 | 45 | 69 | 82 | 1 | 30 | 2 | 50 |
| | | | | | bottom | 21 | 45 | 70 | 82 | | | | |
| | Fast | 2 | high | 30 | surface | 15 | 34 | 65 | 77 | 1 | 40 | 3 | 10 |
| | | | | | bottom | 15 | 36 | 64 | 77 | | | | |
| 7 | Fast | 4 | low | 15 | surface | 16 | 29 | 51 | 67 | 2 | 30 | 4 | 20 |
| | | | | | bottom | 14 | 31 | 52 | 67 | | | | |
| | Fast | 4 | low | 30 | surface | 9 | 23 | 45 | 61 | 2 | 50 | 5 | 20 |
| | | | | | bottom | 7 | 23 | 43 | 61 | | | | |
| 8 | Fast | 4 | high | 15 | surface | 15 | 32 | 53 | 68 | 2 | 30 | 4 | 10 |
| | | | | | bottom | 10 | 27 | 53 | 68 | | | | |
| | Fast | 4 | high | 30 | surface | 10 | 22 | 40 | 59 | 3 | 10 | 5 | 20 |
| | | | | | bottom | 7 | 20 | 40 | 58 | | | | |

**TABLE 2—Concluded**

| DAY | RATE OF COLD WATER FLOW | BATCH SIZE | VISCOSITY OF SAUCE | AGITATION INTERVAL | LOCATION OF THERMOCOUPLE IN BATCH* | TEMPERATURE DROP FROM 140°F. After ½ hr. | After 1 hr. | After 2 hr. | After 3 hr. | TOTAL COOLING TIME FROM 140° to 80°F. | | TOTAL COOLING TIME FROM 140° to 60°F. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Flowing Water at 70°F.# | | | | | | | | |
| | | *gal.* | | *min.* | | *°F.* | *F.* | *°F.* | *°F.* | *hr.* | *min.* | *hr.* | *min.* |
| 1 | Slow | 2 | low | 15 | surface | 15 | 30 | 52 | 58 | 3 | 40 | — | — |
| | | | | | bottom | 15 | 30 | 49 | 56 | | | | |
| | Slow | 2 | low | 30 | surface | 14 | 29 | 47 | 54 | 4 | — | — | — |
| | | | | | bottom | 17 | 31 | 47 | 54 | | | | |
| 2 | Slow | 2 | high | 15 | surface | 16 | 32 | 50 | 56 | 3 | 55 | — | — |
| | | | | | bottom | 18 | 32 | 48 | 55 | | | | |
| | Slow | 2 | high | 30 | surface | 11 | 24 | 43 | 53 | 4 | 10 | — | — |
| | | | | | bottom | 11 | 24 | 43 | 53 | | | | |
| 3 | Slow | 4 | low | 15 | surface | 15 | 23 | 39 | 46 | 5¶ | — | — | — |
| | | | | | bottom | 13 | 20 | 38 | 46 | | | | |
| | Slow | 4 | low | 30 | surface | 11 | 20 | 36 | 42 | 5¶ | — | — | — |
| | | | | | bottom | 7 | 18 | 43 | 42 | | | | |
| 4 | Slow | 4 | high | 15 | surface | 19 | 29 | 41 | 51 | 4 | 35 | — | — |
| | | | | | bottom | 19 | 29 | 41 | 48 | | | | |
| | Slow | 4 | high | 30 | surface | 17 | 23 | 40 | 44 | 4 | 40 | — | — |
| | | | | | bottom | 18 | 23 | 41 | 48 | | | | |
| 5 | Fast | 2 | low | 15 | surface | 27 | 40 | 57 | 63 | 2 | 45 | — | — |
| | | | | | bottom | 26 | 40 | 57 | 64 | | | | |
| | Fast | 2 | low | 30 | surface | 22 | 33 | 52 | 60 | 3 | 10 | — | — |
| | | | | | bottom | 21 | 33 | 52 | 62 | | | | |
| 6 | Fast | 2 | high | 15 | surface | 15 | 31 | 50 | 59 | 3 | 15 | — | — |
| | | | | | bottom | 15 | 36 | 50 | 59 | | | | |
| | Fast | 2 | high | 30 | surface | 20 | 25 | 45 | 53 | 4 | — | — | — |
| | | | | | bottom | 14 | 25 | 45 | 53 | | | | |
| 7 | Fast | 4 | low | 15 | surface | 15 | 31 | 42 | 55 | 4 | 30 | — | — |
| | | | | | bottom | 13 | 33 | 45 | 55 | | | | |
| | Fast | 4 | low | 30 | surface | 13 | 31 | 41 | 51 | 4 | 30 | — | — |
| | | | | | bottom | 15 | 30 | 44 | 52 | | | | |
| 8 | Fast | 4 | high | 15 | surface | 7 | 22 | 40 | 48 | 5¶ | — | — | — |
| | | | | | bottom | 4 | 29 | 42 | 49 | | | | |
| | Fast | 4 | high | 30 | surface | 15 | 24 | 41 | 49 | 5¶ | — | — | — |
| | | | | | bottom | 10 | 18 | 39 | 46 | | | | |

*1½ in. below the surface of the sauce and 1½ in. from the bottom of the stock pot.
†Water inflow temperatures ranged from 34° to 37° F.
‡Water inflow temperatures ranged from 41° to 43° F.
#Water inflow temperatures ranged from 70° to 75° F.
¶Cooled at 82° F.

tion, and a study of the interval between agitations was selected as a factor.

The interaction involving batch size-agitation-temperature (BAT) indicated that the effect of agitation (A) was more pronounced in the 4-gal. batches of sauce than in the 2-gal. batches at all three coolant temperatures. The results of agitation at 15-min. vs. 30-min. intervals were statistically significant; however, when the differences in total cooling times are observed, the merit of agitation at the shorter 15-min. interval may not seem convincing. The practicality of frequent agitation must be considered when the human element is involved. A compromise of 20-min. agitation intervals, or three agitations every hour, might suffice under conditions of a quantity food service operation.

It was noted that, on agitation, the rate of temperature drop of the larger batches was greater than for smaller batches. This observation cannot be too highly emphasized; the need for increasing the rate of cooling within the large batches of food is evident.

Results of preliminary studies showed little differences in the rate of heat loss when the agitation utensil was varied; rather, it was the agitation technique that produced the greatest differences. Agitation involving a complete circling of the contents of the stock pot around the inside circumference of the pot increased the rate of heat transfer over agitation involving circling of the white sauce half way around the inside walls of the stock pot. This points out the importance of developing an efficient agitation technique to increase the rate of heat loss. However, the mere fact that a food is agitated efficiently will not always solve the problem. The nature of the food product itself might be a limiting factor to any method of agitation employed, for the structure and the appearance of the food product may be marred with agitation.

## *General Conclusions*

In this investigation, the influence of only some selected factors on the rate of heat transfer in large batches of white sauce have been determined, namely, the effect of temperature and of flow of the cooling water, batch size and viscosity of the white

sauce, and interval between agitations of the sauce. Now that the effects of these factors have been established, more detailed studies of each of these factors, and any other influencing variables and their combinations should be undertaken.

The use of a bain-marie as a cold water bath might well be considered feasible. The bain-marie is apt to be available for cooling at the close of the food preparation period. It is also large enough to accommodate several institutional-size pots and pans. The installation of a cold water inlet in the bain-marie is easily accomplished.

In contrast, the use of an institutional type sink as container for the coolant in the cooling of foods prior to refrigeration is limited. Such a sink probably could not be devoted to the cooling of large batches of food in many food service operations; it is of small size, and cooling in a sink would put the sink out of general use. Few kitchens can afford to sacrifice a sink and surrounding working area for any length of time.

## *Summary*

A preliminary study was undertaken: (a) to establish two stock pot positions in the bain-marie at which the contents of the stock pots cooled at a comparable rate, (b) to establish a method of agitating the cooling medium, and (c) to study some selected factors affecting the heat transfer in the cooling medium. The results were used to establish methodology for the main study and to select factors worth further investigation.

Results of the preliminary study indicated that: (a) the contents of two stock pots in a certain position of the bain-marie produced comparable total cooling times, (b) the viscosity and batch size of the sauce influenced the total cooling time, (c) agitation *per se* decreased the total cooling time considerably, and (d) the agitation technique and the interval between agitations of the sauce influenced the total cooling time. Since total cooling time was extremely long in the non-agitated batches, agitation *per se* was not chosen as a variable in the main study; the interval between agitations was the selected factor instead.

The main study was conducted to determine the total cooling time in batches of white sauce cooled in flowing cold tap water in a bain-marie, as influenced by a number of selected variables, namely:

(a) The temperature of the water used as the coolant (35°, 42°, and 70°F.).

(b) The rate of water flow through the bain-marie (fast and slow).

(c) The batch size of the white sauce (2- and 4-gal.).

(d) The viscosity of the white sauce (high and low).

(e) The interval between agitation of the white sauce (15 and 30 min.).

The general plan of the main study was to carry out experiments using cold water as the coolant at three temperatures. Each experiment was carried out over a period of eight days. On each day, flow of coolant, batch size, and sauce viscosity were paired, agitation interval being the only varying factor. Agitation was randomly assigned to the stock pots each day. Temperatures were recorded electronically throughout the cooling period. The temperature drop after various periods of cooling and the total cooling time were noted.

The temperature and the rate of flow of the coolant, the viscosity and batch size of the sauces, and the interval between agitations of the sauces were significant main effects at the 1 per cent level. The most effective factors in decreasing the total cooling time were: low temperature and fast rate of flow of the coolant, 2-gal. batch size and low viscosity of the sauce, and 15-min. intervals between agitations.

Mean squares and F values indicated significant two-factor and three-factor interactions at both 1 and 5 per cent levels. All significant interactions contained the main effect temperature. All but one significant interaction contained batch size as a factor.

## *References*

(1) JENSEN, L. B.: Microbiology of Meats. 3rd ed. Champaign, Ill.: Garrard Press, 1954.

(2) BLACK, L. C., AND LEWIS, M. N.: Effect on bacterial growth of various methods of cooling cooked foods. J. Am. Dietet. A. 24: 399, 1948.

(3) WEISER, H. H., WINTER, A. R., AND LEWIS, M. N.: The control of bacteria in chicken salad. 1. *Micrococcus pyogenes* var. *aureau* Food Research 19: 465, 1954.

(4) LONGREE, K., AND WHITE, J. C.: Cooling rates and bacterial growth in food prepared and stored in quantity. 1. Broth and white sauce. J. Am. Dietet. A. 31: 124, 1955.

(5) MILLER, W. A., AND SMULL, M. L.: Efficiency of cooling practices in preventing growth of micrococci. J. Am. Dietet. A. 31: 469, 1955.

(6) HAMMER, M. L.: Some factors affecting the rate of heat transfer and bacterial growth in cornstarch pudding prepared in quantity. M.S. thesis, Univ. of Wis., 1957.

(7) BALL, C. O., AND OLSON, F. C. W.: Sterilization in Food Technology; Theory, Practice and Calculations. N.Y.: McGraw-Hill Book Co., Inc., 1957.

(8) LONGREE, K., AND FELT, S. A.: Quantity white sauce mix. J. Am. Dietet. A. 30: 1131, 1954.

(9) BILLINGS, M. N.: Soft wheat flour in cream pie fillings prepared in small and large quantities. M.S. thesis, Cornell Univ., 1951.

(10) BOZIVICH, H., BANCROFT, T. A., AND HARTLEY, H. O.: Power of analysis of variance test procedures for certain incompletely specified models, I. Ann. Math. Stat. 27: 1017, 1956.

(11) JAKOB, M.: Heat Transfer. Vol. 1. N.Y.: John Wiley & Sons, Inc., 1949.

# *Calcium in Urban Family Food Supplies*[1]

**CALLA VAN SYCKLE, Ph.D.**

*Washington State College, Pullman*

CALCIUM IN THE family food supplies deserves special study because many family dietaries in this country provide less than the recommended allowances (1). The U. S. Department of Agriculture's 1955 food consumption survey (2) showed that the home food supplies of 30 per cent of the nation's urban families were below the recommendation for calcium. This percentage was practically the same (29 per cent) in 1948 (2). Food habits are slow to change.

The Recommended Dietary Allowances are for nutrients actually eaten. Depending on family practices, varying amounts of the nutrients in the food supplies are lost when discarded in preparation, or from spoilage or plate waste. Also, appetites for particular foods vary among family members. Therefore, unless the food supplies have somewhat higher nutrient values than the recommendations, it is unlikely that each person sharing the family food supplies will have available the recommended amounts of all nutrients.

In a study of household food consumption in Everett, Washington (3), 36 per cent of the families had food supplies which furnished less than the calcium allowance. No calcium was supplied by the city water and relatively few persons took a calcium supplement.

## *Calcium Contribution of Different Foods*

The contribution of different foods to the calcium in the Everett food supplies is shown in Figure 1. From this graph, it is apparent that dairy products are the most important food source of calcium. "Dairy products" include any kind of fresh fluid milk (whole, skim, buttermilk, chocolate milk, half and half); processed milk (evaporated, condensed, dried); cream, ice cream; and American, cottage, and other cheeses. Not all of the 170 Everett households in the study used each of these dairy products. The range of use of those who did was wide. Each product contributed an important amount of calcium to the dietaries of those families using it.

## *Food Supplies Furnishing Calcium*

To show how family food supplies having different levels of calcium varied in their make up, Everett households were divided into three approximately equal groups. One group had supplies furnishing from 35 to 96 per cent of the recommended allowances; a second, supplies furnishing 97 to 133 per cent; and a third, supplies furnishing 134 to 333 per cent. Average amounts of important foods—calcium-wise—used per nutrition unit per week at the different calcium levels were computed. The nutrition unit in this case was the calcium unit.

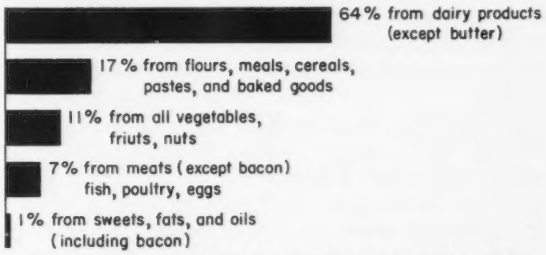

64% from dairy products (except butter)
17% from flours, meals, cereals, pastes, and baked goods
11% from all vegetables, friuts, nuts
7% from meats (except bacon) fish, poultry, eggs
1% from sweets, fats, and oils (including bacon)

FIG. 1. *Sources of calcium in the household food supplies for one week's meals.*

The number of calcium units in a household or group of households indicates the calcium-intake allowance of the group. One calcium unit in this study represents the recommended allowance for a man twenty-one to thirty-four years of age, of average size and activity, for twenty-one meals from home supplies. Each person's allowance for calcium was expressed as a proportion of the reference man's allowance. The sum of the relative values for a household shows the household size in calcium units. This measure takes into account the number of persons in each age and sex group sharing the family food supplies and the number of meals (out of twenty-one) each takes from the supplies (4).

[1]Scientific Paper No. 1750, Washington Agricultural Experiment Stations, Pullman. Work was conducted under Project 1132. Received for publication July 28, 1959.

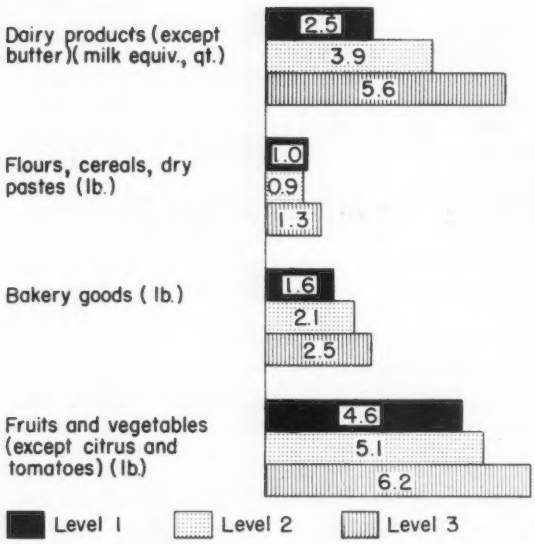



FIG. 2. *Quantities of important calcium foods used per calcium unit per week by households at three levels of calcium usage.*

In Figure 2 are compared the quantities of important calcium foods used per calcium unit per week by households at three levels of calcium intake. While households at the highest level used more of all the foods, the greatest difference between each level and the next is in the use of dairy products.

The use of dairy products at different calcium levels is shown in Table 1. The amounts for each product are in units commonly used and show the average quantities supplied in the week per calcium unit.

The different dairy products contributed varying amounts of calcium to the diet. The most important products in terms of calcium per pound were cheese and dried or other processed milk. In terms of average quantities used by all households and calcium content, the most important products were fresh fluid milk, cheese, and evaporated milk. On this latter basis, major differences among the household groups in Table 1 were in the use of fresh fluid milk and cheese.

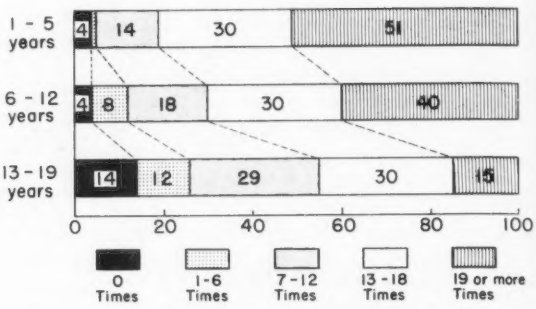



FIG. 3. *Number of times milk was drunk by children at home and away during one week; percentage distribution of children in three age groups.*

## *Cost of Dairy Products*

Taking all dairy products together, households at Calcium Level 3, compared with those at Level 1, achieved an increase of 56 per cent in the equivalent of fresh fluid milk[2] at a 50 per cent increase in expense for it (Figure 2 and Table 1). The varying prices at which the same amount of calcium—that in 1 qt. milk—can be obtained from different products made this saving possible. Level 1 households paid an average of 23 cents per quart of milk equivalent, while Level 2 and 3 households paid 22 cents. Individual households did much better. Using different combinations of products, families that had calcium supplies of 0.8 gm. or more per calcium unit spent from 16 to 39 cents per quart of milk equivalent.

[2]Milk equivalents of dairy products (except butter), in terms of protein and calcium, as developed by the USDA's Institute of Home Economics. The factors used in this study for converting pounds of products to quarts of milk were:

| | |
|---|---|
| Evaporated milk | 0.93 |
| Condensed milk | 1.11 |
| Nonfat dry milk | 4.56 |
| Cream | 0.33 |
| Ice cream | 0.56 |
| Cottage cheese (based on protein only) | 2.63 |
| American, Swiss, Bleu, and grated cheese | 3.20 |

In addition, the conversion factor of 0.44 was used for SMA, a liquid infant formula.

**TABLE 1 Quantities and cost of different dairy products used per calcium unit from home food supplies during one week**

| CALCIUM LEVEL* | NUMBER OF HOUSE-HOLDS | CALCIUM UNITS PER HOUSE-HOLD | QUANTITIES OF DAIRY PRODUCTS USED PER CALCIUM UNIT | | | | | | | EXPENSE FOR DAIRY PRODUCTS PER CALCIUM UNIT† |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Any fresh fluid milk | Cream, light or heavy | Evapo-rated milk | Nonfat dry milk | Ice cream | Cottage cheese | All other cheese | |
| | | | *qt.* | *cups* | *cups* | *Tbsp.* | *pt.* | *cups* | *lb.* | |
| Level 1 | 58 | 4.54 | 1.73 | 0.08 | 0.37 | 0.5 | 0.32 | 0.11 | 0.08 | $0.58 |
| Level 2 | 56 | 4.04 | 2.95 | 0.14 | 0.31 | 1.0 | 0.24 | 0.20 | 0.10 | .87 |
| Level 3 | 56 | 3.00 | 4.36 | 0.12 | 0.48 | — | 0.38 | 0.30 | 0.15 | 1.26 |

*See text for definition of levels.

†Includes cost of condensed milk and SMA (a condensed infant formula) used by only a few families divided among the three calcium levels.

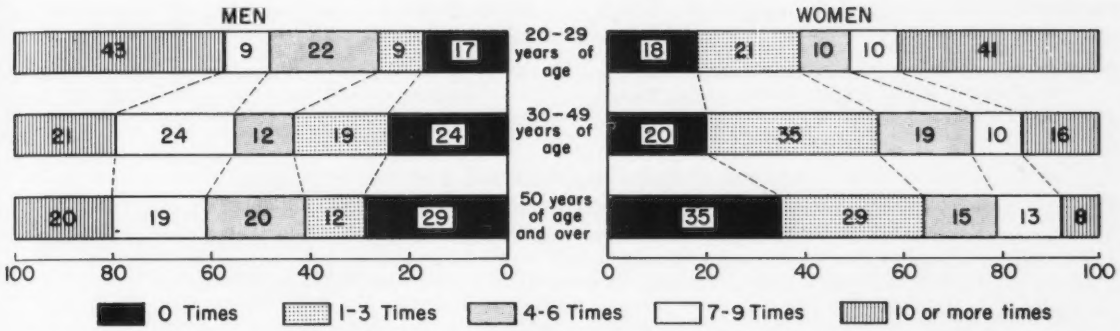



FIG. 4. *Number of times milk was drunk by adults at home and away during one week; percentage distribution of men and women in three age groups.*

## *Factors Affecting the Calcium Level*

Income level and type of household both affected the calcium level of the food supplies. More low-income households than in the middle or high brackets were in the group at calcium Level 1. Households with children were more frequently found at calcium Level 1 and much less frequently at Level 3 than were households of all adults.

Effective food knowledge, both nutritional and economic, on the part of the homemaker may logically be presumed to be an important factor. Food habits, particularly in relation to use of dairy products, may well be the most important factor. In Everett, fresh fluid milk accounted for 75 per cent of the total milk-equivalent value, and three-fourths of the fresh milk was used as a beverage. The milk-drinking habits of the family members were therefore especially important.

Figures 3 and 4 are indicative of milk drinking by members in different age and sex groups (excluding infants). Milk drinking both at home and away from home for one week is covered. The drinking of no milk by a few children is accounted for by two large households that used evaporated milk only and by one child who drank soybean milk only because of an allergy. The sharp drop in milk drinking after age twelve is very noticeable, as is the increase in the percentage of those who drank no milk or drank it less than once a day during the week. Figure 4 indicates an increase in "no drinking of milk" with increase in age of both men and women. In general, men at each of the age levels drank milk more frequently than women. This is particularly noticeable in the "50 years and older" group.

The number of times milk was drunk during the week does not tell us the *amount* drunk unless the number is zero. Glasses vary in size and only part of a glass or more than one glass may be taken. However, a study of 226 Everett households reported earlier (5) showed that, because of the school milk program, there was a slight increase in the average quantity of milk drunk in one week by the six- to twelve-year-old children over the one- to five-year-olds. A sharp drop occurred (45 per cent) in the average quantity drunk by the twenty- to twenty-nine-year-old adults compared with the adolescents of thirteen to nineteen years of age. There was a 26 per cent drop between the adult group in their twenties and those in their thirties and forties. A slight increase occurred in the quantity drunk by the oldest adults as compared with the next younger group. Figures by sex were not available in the report.

## *Summary*

Dairy products, especially fresh fluid milk, evaporated milk, and cheese, were the most important source of calcium in Everett, Washington family dietaries. However, other dairy products (except butter) contributed important amounts of calcium.

The calcium in 1 qt. milk, roughly 1 gm., is available at widely varying cost in the different dairy products. Households having the recommended allowance of calcium spent from 16 to 39 cents per quart of milk equivalent, depending on the combination of products used.

Food habits, particularly with regard to milk and cheese, were probably the most important determinants of the calcium level of the food supplies. Fresh fluid milk accounted for 75 per cent of the total milk equivalent used by Everett households, and three-fourths of all fresh milk was used as a beverage. Reports of milk drinking by family members both at home and away showed that men drank milk more often than women and that more women than men of fifty years or older drank no milk. A sharp drop in milk drinking occurred between age groups six to twelve and thirteen to nineteen years.

## *References*

(1) FOOD & NUTRITION BD.: Recommended Dietary Allowances, Revised 1953. Natl. Acad. Sci.—Natl. Research Council Pub. No. 302, 1953.

(2) Dietary Levels of Households in the West. USDA Household Food Consumption Survey 1955, Rpt. No. 10, July 1957.
(3) VAN SYCKLE, C.: Household Food Consumption in Everett, Washington. Wash. Agric. Exper. Sta. Bull. No. 580, March, 1958.
(4) LE BOVIT, C., AND STIEBELING, H. K.: Applying 1953 dietary allowances to U. S. population groups. J. Am. Dietet. A. 33: 219, 1957.
(5) VAN SYCKLE, C.: Consumption of fresh and evaporated milk and dry milk solids. J. Am. Dietet. A. 31: 1228, 1955.

## A.D.A.'s Concern for Children and Youth

The professional and scientific contribution of The American Dietetic Association has increased as a result of activities pertaining to the Golden Anniversary White House Conferences on Children and Youth, to be held March 26 to April 2, 1960 in Washington, D.C. Judging by research and other concerns for the welfare of children, the Association is meeting its responsibility as one of the sponsoring national organizations. The contributions published in the JOURNAL have scientific and educational merit.

At the time of the Midcentury White House Conference on Children and Youth in 1950, Dr. Ercel S. Eppright, our representative, assembled facts to determine the scope of interest in meeting needs and concerns of children by members of the Association. More recently, she has compiled from this JOURNAL a bibliography of 190 references dealing with children which has been published in the interim between 1950 and 1959. (A limited number of copies of this bibliography are available on request from Dr. Eppright, in care of the Food and Nutrition Department, Iowa State University, Ames.) In analyzing the bibliography, from the standpoint of subject matter and in reflecting on nutrition in relation to the general focus of the 1960 Golden Anniversary White House Conference on Children and Youth, Dr. Eppright comments:

"This compilation shows the emphasis given the subject of children in our publication, and also in a way reflects the trends in research and current concerns.

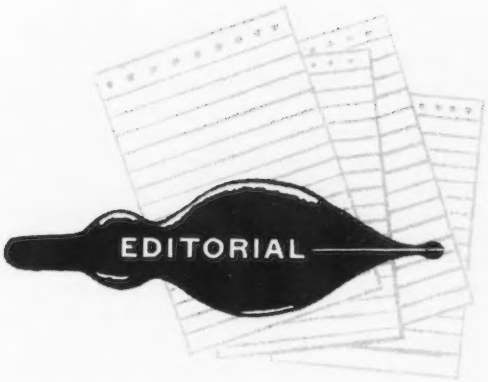
"A majority of the papers relate to nutritional status. Taken together, they probably give a fairly good picture of the food habits, apparent nutrient intake, and to some extent the nutritional status of children. Since this is a period of peace and prosperity, the mean body measurements and concentrations of blood constituents of groups of children may form reasonably good standards by which to measure some aspects of growth and development of children with heritage similar to ours. The recent studies have focused attention on certain groups of children, whose food intakes are especially poor.

"Wide gaps exist in our knowledge of the true requirements of children taken individually. Since the work of the Children's Fund of Michigan, we have little exact information on the chemical aspects of growth and maturation. Hence requirements are still somewhat speculative.

"Dr. Genevieve Stearns at the State University of Iowa, Iowa City, has shown the effect of emotional disturbances on the utilization of nutrients, especially calcium. She has also called attention to the extra nutritional stress of the teenage mother-to-be, the probability of a poor diet with pregnant girls from low-income groups, and the subsequent effects on the infant. Considerable interest has centered around obesity as a problem among adolescent girls.

"Despite the progress in child nutrition, many problems need to be solved. There is a growing appreciation of the need to identify the factors which influence children's eating habits and of the closely related topic of the influence of eating habits on their behavior. The potential of good nutrition and happy meal times on the child's personality and the prevention of juvenile delinquency is now only a matter of conjecture. Some concrete evidence of this relationship would be helpful—or perhaps better yet, would be a convincing demonstration of how good nutrition and good meal time practices in the home are reflected in the performance and behavior of children.

"I am not certain that we have made any great advances in getting young people to want or care about good nutrition. The appeal of health, which is most commonly used, may not be very potent because most youngsters never have had the fear of losing their health and hardly know how to value it. As we gain more information by which we can accurately interpret good nutrition in terms of personal appearance, personality development, and acceptable social behavior, I think we will make more headway. Perhaps first we should explore more fully the values and goals of children of all ages. Also, it may be that the increased focus on science will offer another opening wedge."




# New Dimensions[1]

CORA E. KUSNER

*Director of Dietetics,*
*Colorado State Hospital,*
*Pueblo*

A DIETITIAN WHO speaks of "new dimensions" could talk of many things. She might refer to body contours and the achievement of dimensions usually described as 36, 23, 36! Or, she might be thinking in terms of a kitchen layout and the space required for certain food preparation equipment—or, she might be concerned about world nutrition and the new dimensions of our knowledge of the needs of the children in some far corner of the globe. On the other hand, in this "space age" she might be interested in special foods for proper nourishment of the men on an atomic submarine, or for those who will one day land on the moon. Certainly this is a day of many new dimensions for dietitians—*and* for The American Dietetic Association.

The new dimensions which concern me here, however, are within each one of us in the realm of our thinking. For centuries men have studied the human mind, and many have described the relationship between the mind of man and his actions, between what he thinks of himself and of his work and how he does that work. Familiar to all of us are the words of Solomon: "As a man thinketh in his heart —so is he." Less familiar perhaps is a quotation from Oliver Wendell Holmes' *The Autocrat of the Breakfast Table:* "Man's mind stretched to a new idea never goes back to its original dimensions." What an intriguing thought—that by the very contemplation of an idea new to our thinking, we grow in mental stature! It need not even be a totally new idea. Sometimes an *old* idea—something you have heard or known for years—takes on new meaning when placed in a new context.

Four factors make new concepts of an administrative dietitian's responsibility imperative today—particularly in the hospital field.

## *Shortage of Dietitians*

The fact that there are simply not enough professionally trained dietitians to fill the need makes consideration of technically trained food supervisors mandatory. What *is* our responsibility in this area? Are there positions in your organization which could be adequately filled by capable people with less than five years' education and training?

It is so easy to be critical of the small hospital which uses an untrained individual to manage the food service, but have *you* tried to obtain a dietitian lately? A survey by the American Hospital Association in late 1957 showed that of 6818 hospitals, reporting, over 4000 were under 100 beds. Of these, 3321 were non-federal, short-term general and special hospitals. In these 3321 hospitals, there were only 476 full-time dietitians who were members of The American Dietetic Association. With more small communities building hospitals each year, statistics such as these point up the need for a new approach in solving the problem of the shortage of dietitians.

We may look with scorn on the person with less than professional training who calls herself a dietitian, but what have you done to *help* these people to better understanding? Do *you* demonstrate your greater skill? We need to forget ourselves, think less about our own status, be less concerned about our proper title, and remember that as professional women we have a contribution to make, a debt to pay for our greater opportunity, a service to give to justify our privilege.

We must clarify our thinking. When we see the situation of not enough dietitians as it really is, we will take our rightful leadership in providing training and encouragement and job status commensurate with the training and ability of those who can help us attain our objectives—the greatest good for the greatest number, and better nutrition for all.

## *Our Responsibility for Training*

Labor costs are at an all time high and are likely to go even higher. We can no longer afford to operate with inefficient untrained labor, using too many to accomplish too little. This applies all along the line, from the pot washer, for whose training the dietitian is responsible, to the dietitian herself.

The management and training of personnel are more important today than *any other* functions in a food service unit. Making the most of the human resources at our disposal is a major responsibility.

A well organized dietary department will have a written work schedule for every job and a written

[1]Presented at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles, on August 26, 1959.

outline for breaking in a new employee on that job. Standards must be established for how much a new employee should know about the job at the end of the first day, the second day, and when he should be "on his own."

Industry is almost universally using the method of tell, show, and tell back, which was developed during World War II. If you are not familiar with this training technique, there are many sources of information regarding it.

Standards must be established for each job and how it is to be done. Some system of evaluation of an employee's performance ought to be maintained and used as a means of stimulating effort toward improvement. Management must also be interested in *development* of employees from the top down to the lowest level.

We frequently talk about delegation of duties. This is not, as we are prone to think, a "throwing off" of responsibility. The person who deputizes another to perform some of her functions is still held accountable for results. Before we can delegate successfully, we must organize, train, and provide clear channels for evaluating and controlling the work to be done.

## *Maintaining Our Own Standards*

Competition from commercial food management companies is forcing us as professional dietitians to reconsider carefully our managerial skills. Inherently we rebel against the thought that an organization or an individual whose interests are primarily commercial can supplant us. We have prided ourselves on our professional ideals, and we must not relinquish that pride. Let us not forget, however, that a prime function of a professional group is not only to maintain high *ideals* but also high standards of *skill* among its members. This is an individual responsibility. Our Association can point the way, but only as each one of us proves her individual worth will we be able to maintain the status of our group.

## *Emphasis on Sanitation*

Current emphasis on sanitation as a means of preventing the spread of staphylococcus infections in hospitals places a special responsibility on the administrative dietitian. Training food handlers in personal hygiene, effective dishwashing procedures, proper storage of food, and proper care of trash and garbage are all receiving renewed emphasis today. The qualified dietitian ought to lead the way in establishing sanitation standards—so much so that accreditation surveyors and city or state sanitation inspectors coming into our units would immediately sense that a qualified person is managing the operation.

Travis Elliott, management consultant for the National Restaurant Association, makes a distinction between operators and managers (1). He says that the *operating* functions include: buying, storing, cooking, serving, cleaning. (I would assume that Mr. Elliott would also mean, in a large enough organization, supervision of these functions.) He lists the basic *management* functions as: planning, organizing, coordinating, directing, and controlling. Stretch your mind to apply this concept to your own situation. Some of you will probably find that you are both operator and manager. Perhaps your job is to be a manager, and you need a new look at your responsibility. Is it possible that we sometimes become so engrossed in the mechanics of operation of our food service that we have no time to be managers? It is not a question of which functions are the most important. Both are of importance, but the point Mr. Elliott makes which is significant is that management functions must be performed efficiently *before* operating functions can be efficient.

Management skills used to the fullest can:

(a) Mold a group of employees into an effective working force. Our employees are what we make them! If your working force is thoughtless and careless and incompetent, it is not an indictment of them, but of your own managerial skill.

(b) Develop a functioning supervisory system. Key people *can* be trained to assume supervisory responsibility. We must think of supervision not as policing, but as teaching, stimulating to better performance, and the developing of individuals.

(c) Establish quality standards and cost controls. Quality food ought to be the hallmark of a qualified dietitian. This means standard recipes, since few hospitals can depend on a skilled chef. It means tasting and testing and constant vigilance. It means production control with regard to timing so that food is not prepared hours ahead of serving time.

If for just one year, every working member of The American Dietetic Association would take as a personal project an attempt to change the too-often-heard derogatory expression "hospital food" to something such as "the food is wonderful. You know, they have a qualified dietitian!" this would do more for our public relations and recruiting programs than any other action we might take.

Cost control is more than cost accounting. It begins with purchasing specifications, comparative prices, and adequate receiving procedures. Costs are controlled by standardized recipes, good production, and portion control. Figures on paper are useful only as they are used to uncover areas that need special attention.

(d) Maintain sanitation standards. When employees are made aware of the importance of sanitation, they will be your best allies. In fact, with any training, understanding of the reasons for rules and regulations doubles the probability of compliance.

These things we *must* do.

Let me quote a part of a Bulletin of the Joint Commission on Accreditation of Hospitals (2). This Commission as you know is made up of members representing the American College of Physicians, the American College of Surgeons, the American Hospital Association, the American Medical Association, and the Canadian Medical Association. This bulletin lists "the commonest faults" reported by surveyors:

(a) Lack of thermometers and temperature controls in large refrigerators.

(b) Lack of temperature and thermostatic controls on dishwashing apparatus and even when present, not utilized. Hand-drying of dishes.

(c) Poor and unsanitary garbage control and disposal.

(d) Storage of uncovered food in the same refrigerator with drugs.

(e) Failure to clean ice storage bins. This is quite frequently found.

(f) Presence of unimaginative, unpalatable, repetitious, stereotyped modified diets.

(g) Poor housekeeping and sanitation in the department.

(h) Uninstructed personnel in the handling, presentation, and disposal of food.

(i) Poor transportation of food resulting in cold, unpalatable food.

This report states: "It is the opinion of the Joint Commission that this [the dietary] department should be under the supervision of a qualified dietitian (preferably A.D.A. registered) on a full time basis if possible, or in smaller hospitals on a consultative part-time basis."

Are you improving your standards? First we must stretch our minds to see our situation as it really is, then set our goals and plan, organize, coordinate, direct, and control not only the particular situations for which we are responsible, but ourselves, until our goals are reached. Administrative dietetics was born of the need for better food to fill therapeutic dietary prescriptions. Gradually the scope of work broadened to include the many facets of today's work. Change is as inevitable in our field as it is in any phase of life. We must not fear and resist it. The fine professional dietitian will make herself and her association felt in deciding what direction changes will take. She herself will feel secure in the knowledge that she has a contribution to make which is hers alone.

## *References*

(1) ELLIOTT, T.: Too many operators, not enough managers—top management development first need of food service industry. Food Service Magazine 20: 32 (May), 1958.

(2) Dietary department. Bull. Joint Commission on Accreditation of Hospitals, No. 16, Dec. 1957, p. 3.

### *Canned Apples Can Save Both Time and Money*

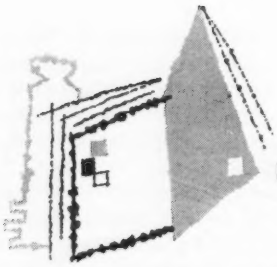
A comparative study of production costs and time standards using fresh, frozen, and canned apples in institutional food preparation was recently completed at Montana State University under the direction of Lendal H. Kotschevar, Ph.D. Three commonly served products were prepared: apple pie, apple Betty, and applesauce.

In preparing apple pie, total savings using canned vs. fresh apples amounted to 20 per cent; labor cost was 31 per cent less, and ingredients were about 17 per cent lower. Labor cost for handling the pies for filling (other labor for the pies, of course, remained the same) dropped from 90 cents for pie made from fresh apples to 4 cents with canned apples. To prepare an 18-lb. batch of apples for 100 servings of apple pie, 116 steps were needed with fresh apples, 31 steps with frozen apples, and only 28 steps with canned apples (to get three No. 10 cans from the storeroom and open them). The times involved were: fresh apples, 52 min., 48 seconds; frozen apples, 2 min., 32 seconds; and canned apples, 2 min., 20 seconds. Total costs were, respectively: fresh apples, $7.09; frozen apples, $6.91; and canned apples, $5.69. A single pie made with fresh or frozen apples cost 44 cents compared with 35 cents with canned fruit. On a per-serving basis (one-sixth pie per serving), the cost dropped from 7.4 cents for fresh apples to 4.9 cents for canned.

The story was similar for apple brown Betty. For 100 servings, total cost using fresh apples was $6.95; for frozen apples, $6.848; and for canned, $5.189. Translated into per-serving costs, this meant: 7 cents for fresh apples; 6.9 cents for frozen; and 5.2 cents for canned.

With applesauce, a total saving of 50 per cent was achieved using canned apples, most of which was accounted for by labor savings (97 per cent lower), although ingredient cost was also below that of fresh apples by 34 per cent. Cost per serving for applesauce made with canned apples was 2.9 cents compared with 5.7 cents with fresh apples, and 5.3 cents with frozen.

Dr. Kotschevar is now Professor of Hotel, Restaurant, and Institution Management, Michigan State University, East Lansing.



## BOOK REVIEWS

**Let's Have Healthy Children.** Revised edition. By Adelle Davis. New York: Harcourt, Brace and Company, 1959. Cloth. Pp. 314. Price $3.50.

This revised book for mothers and expectant mothers advances the worthy concept that good nutrition is essential for healthy mothers and children. But, the author's account of *how* good nutrition can be attained, *why* the Davis diet is prescribed, and *what* the consequences are of failure to meet her dietary standards constitutes a confusing mixture of fantasy, half-fact, inconsistency, and outright error.

The Davis approach is demonstrated in her diet for pregnancy. First, she establishes her own dietary allowances, which, with the exception of calories, are notably greater than those of the National Research Council—some as much as three to six times higher. For example, the National Research Council recommends 6,000 I.U. vitamin A daily; Davis, 25,000 I.U. She erroneously refers to the Recommended Dietary Allowances as "minimum requirements," so placed to consider lowest income levels. She ignores documented scientific support for the allowances which ". . . are meant to afford a margin of sufficiency above minimal requirements and are therefore planned to provide a buffer against the added needs of various stresses and to make possible other potential improvements of growth and function."

To meet her own inflated allowances, Davis bolsters the diet with those symbols of food faddism—black strap molasses, brewer's yeast, wheat germ, and yogurt, as well as with large doses of mineral and vitamin concentrates. Thus the fad diet is made to appear reasonable and necessary for normal pregnancy. Recommended daily meals are interlaced with fad-type foods. In addition, twice daily—after breakfast *and* after supper—the following concentrates are prescribed: "1 vitamin-A capsule, 25,000 units, preferably water soluble; 1 vitamin-C tablet, 100 to 250 milligrams, especially if no citrus fruit or juice has been taken; 1 vitamin-E capsule, 100 units; 2 or 3 tablets supplying calcium, iron, and trace minerals; 1 vitamin-D capsule, 25,000 units, taken every Sunday and Wednesday."

The author disregards the fact that most mothers can meet the liberally adequate Recommended Dietary Allowances by eating a well balanced variety of everyday foods; that a new awareness of dietary inter-relationships enhances the importance of foods as such, over synthetic sources of nutrients; and that excessive vitamin intake is extravagant moneywise, is wasteful of nutrients, and, in the case of certain vitamins, may actually be harmful to health.

A few of the many examples of the Davis dietary counsel to mothers: ". . . most of the complications of pregnancy are caused by a lack of the B vitamins"; "Only by eating wheat germ, yeast, liver, and possibly yogurt . . . can the need for the entire B group be met"; "Studies of extremely large infants . . . have shown that such babies usually result when the mother's basal metabolism is low because of insufficient iodine intake and/or perhaps lack of B vitamins."

Sections of the book relating to infant and child feeding are similarly vulnerable. Raw milk (certified) is advocated. Black strap molasses and brewer's yeast are introduced into the nursing bottle. A variety of nutrient concentrates is freely recommended.

As cited, the book ignores basic principles of nutrition, misinterprets the facts, and makes unwarranted applications. It belittles sound nutritional investigation. Its recommendations tend to destroy confidence in common, inexpensive foods as adequate sources of nutrients. The tone of the book may encourage self-diagnosis and treatment. It urges, for example, that readers ". . . learn to recognize symptoms of deficiencies and measures for correcting them."

It would be folly to underestimate the influence of this book and others like it. Unfortunately, this influence has even extended in some cases to professionally trained persons. When they use and endorse such publications, they unwittingly play into the hands of the faddists and allow their prestige to further a cause which seeks to undermine their own profession. Obviously, the Davis book has no place as a serious reference on the desks of professional persons, or on the recommended readings lists which they prepare for staff, students, or the public.

In light of the alarming spread of food faddism, it behooves dietitians and nutritionists to know the content of the Davis book, to be aware of its errors, and to expose them; more important, to analyze the secrets of this book's acceptance and emulate them. Granted that it may be easier to glamorize nutrition, uninhibited by facts; nevertheless, with resourcefulness, the truth can be made just as convincing. Nutrition educators have a professional responsibility, not merely to condemn food faddism, but to provide sound effective nutrition information for those unable to distinguish between the true and the false. The very receptiveness of the public to food fads shows a basic interest and need for such information which it can understand and apply.—*Ethel Austin Martin, author of* Roberts' Nutrition Work with Children, *Barrington, Illinois.*

### RECENT BOOKS RECEIVED

**Basic Bacteriology—Its Biological and Chemical Background.** Second edition. By Carl Lamanna, Ph.D., and M. Frank Mallette, Ph.D. Baltimore: The Williams & Wilkins Company, 1959. Cloth. Pp. 853. Price $13.50.

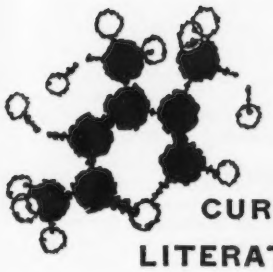
**The Arterial Wall—Aging, Structure, and Chemistry.** Edited by Albert I. Lansing, Ph.D. Baltimore: The Williams & Wilkins Company, 1959. Cloth. Pp. 259. Price $7.50.

**Food—The Yearbook of Agriculture.** Edited by Alfred Stefferud. Washington, D.C.: Government Printing Office, 1959. Cloth. Pp. 736. Price $2.25.

**Nutrition and Atherosclerosis.** By Louis N. Katz, M.D., Jeremiah Stamler, M.D., and Ruth Pick, M.D. Philadelphia: Lea Febiger, 1958. Cloth. Pp. 146. Price $5.

**Nutrition in Health and Disease.** 13th edition. By Lenna F. Cooper, Sc.D., Edith M. Barber, Helen S. Mitchell, Ph.D., and Henderika J. Rynbergen. Philadelphia: J. B. Lippincott Company, 1958. Cloth. Pp. 734. Price $6.

**A Training Guide for Restaurant Sales Personnel.** By Indiana University, Indiana Restaurant Association, and Vocational Division, Indiana State Department of Public Instruction. Dubuque, Iowa: Wm. C. Brown Company, 1959. Paper, spiral bound. Pp. 125. Price $2.50.



# CURRENT LITERATURE

*Contributed by Janette C. Carlsen, The Johns Hopkins Hospital, Baltimore; Clara Karl Frederick, University of Chicago Clinics; Elizabeth Tuft, Chicago Wesley Memorial Hospital; and the Journal staff*

## AMERICAN JOURNAL OF DIGESTIVE DISEASES

*Vol. 4 n.s., September, 1959*

*Relationship between blood amylase and factors affecting carbohydrate metabolism. II. Influence of ACTH, hydro-cortisone, liver disease and pancreatectomy. D. A. Dreiling, W. S. Rosenthal, M. Kass, and H. D. Janowitz.—p. 731.

**Blood Amylase and Carbohydrate Metabolism.** The depression in blood amylase, after the intravenous administration of glucagon, which occurs in patients without liver disease, is absent in subjects with hepatocellular damage, but it may occur in the absence of the pancreas. This appears to indicate that the liver is an important site of blood amylase level regulation. After the intravenous administration of ACTH and hydrocortisone, the blood amylase response is diphasic: initially depressed and secondarily elevated. This response is observed in patients with and without "hepatitis," but appears less marked in the latter. It is suggested that these variations in amylase are related to the effects of these substances on carbohydrate metabolism.

## ANNALS OF BIOCHEMISTRY AND EXPERIMENTAL MEDICINE (India)

*Vol. 19, April, 1959*

*The effect of supplementing poor jowar diet with Indian multipurpose food on the growth and composition of body and liver of albino rats. K. Joseph, M. N. Rao, M. Swaminathan, A. N. Sankaran, and V. Subrahmanyan.—p. 87.

*Nutritive value of pumpkin proteins. S. H. Kamath and K. Sohonie.—p. 95.

**Multipurpose Food in India.** An Indian multipurpose food (MPF), consisting of a blend of low-fat groundnut (peanut) flour and Bengal gram, fortified with calcium salts, riboflavin, and vitamins A and D, has caused a marked increase in the growth-promoting value of poor Indian diets based on jowar and other cereals. Since increase in body weight may not always be a true index of increase in body protein, the effect of supplementation with MPF and also with nonfat dry milk was studied on the composition of the body and liver of rats. These two supplements and a combination of both all improved the growth-promoting value of the jowar diet. The different supplements did not show significant differences in weight increase. The increase in bodyweight due to the protein supplement was accompanied by a corresponding increase in the tissue protein also.

**Pumpkin Proteins.** Since pumpkin is available throughout India, the quality of the total proteins of this vegetable was studied. Methionine was the limiting amino acid. The biologic value of pumpkin powder is 60 per cent, and the true digestibility, 72 per cent. The differences in values for pumpkin, when compared with casein at the 5 per cent level, were significantly lower. Electrophoretic analyses of sera of rats maintained on the vegetable and casein diets did not show much difference. Although lacking many essential amino acids, pumpkin has potentiality and promise as a supplement to cereal diets.

## ANNALS OF INTERNAL MEDICINE

*Vol. 51, September 1959*

*Optic neuritis and uncontrolled diabetes mellitus in 14 patients. P. G. Skillern and G. Lockhart, III.—p. 468.

Studies of the serum proteins. III. A syndrome associated with alpha-3 globulinemia. F. W. Sunderman, Jr., and F. W. Sunderman.—p. 488.

Syndrome of extreme obesity and hypoventilation: Studies of etiology. J. D. Hackney, M. G. Crane, C. C. Collier, and S. Rokaw. —p. 541.

Idiopathic hypoalbuminemias: Clinical Staff Conference at the National Institutes of Health.—p. 553.

**Optic Neuritis and Uncontrolled Diabetes.** Fourteen patients with optic neuritis and uncontrolled diabetes were studied. The onset of the visual loss was gradual in sixteen eyes and rapid in six. The visual loss, ranging from moderate to severe, was bilateral in eight and unilateral in six patients. Control of the diabetes arrested the loss of vision in all but one of the patients. However, only one patient showed significant improvement in vision after the diabetes was controlled.

## ARCHIVES OF INTERNAL MEDICINE

*Vol. 104, September 1959*

*Chlorpropamide in the management of diabetes. S. J. N. Sugar, L. J. Thomas, and T. M. Eugenio.—p. 360.

*Serum cyanocobalamin (vitamin $B_{12}$) as an index of hepatic damage in chronic congestive heart failure. M. Rachmilewitz, Y. Stein, Aronovitch, and N. Grossowicz.—p. 406.

*Failure of oral therapy in the maintenance of pernicious anemia. L. G. Suhrland, D. Rubin, A. S. Weisberger, and G. C. Meacham.—p. 411.

Corticotropin (ACTH) and adrenal steroids in liver disease. M. B. Goldgraber and J. B. Kirsner.—p. 469.

*Vol. 104, October, 1959*

Hepatic coma. Editorial.—p. 515.

Studies on urinary lipase. IV. Urinary lipase in carcinoma of the pancreas. M. M. Nothman and A. D. Callow.—p. 568.

**Chlorpropamide in Diabetes.** Of eighty-four diabetic patients, 62 per cent were satisfactorily controlled with chlorpropamide (diabinase). Toxicity to the drug was somewhat related to dosage and was characterized by chest pain, muscular weakness, and gastro-intestinal symptoms. The most easily controlled patients are middle-aged persons with relatively recent onset of diabetes, requiring less than 40 units insulin per day. Patients with unstable diabetes of any age are poor candidates for control with chlorpropamide.

**Vitamin $B_{12}$ as an Index of Hepatic Damage.** Serum cyanocobalamin activity was estimated in twenty-eight patients suffering from severe chronic congestive heart failure. In twenty-three, serum levels were elevated. These levels decreased when compensation was attained. The vitamin $B_{12}$ concentration may serve as an index of hepatic damage in persons with chronic congestive heart failure.

**Failure of Oral Therapy in Pernicious Anemia.** During a three-year period, 5 of 116 patients with pernicious anemia had relapse while taking an oral preparation containing both cyanocobalamin (vitamin $B_{12}$) and intrinsic factor. The patients who relapsed showed a marked resistance to the effect of commercial intrinsic factor. Even those who did not relapse showed a diminution in response to intrinsic factor. Parenteral therapy of pernicious anemia with cyanocobalamin is still the treatment of choice.

## THE CANADIAN MEDICAL ASSOCIATION JOURNAL

*Vol. 81, August 1, 1959*

*Allergy in Canada. C. H. A. Walton.—p. 177.

*Vol. 81, August 15, 1959*

*Treatment of arthritis by nicotinic acid and nicotinamide. A. Hoffer.—p. 235.

*Vol. 81, September 15, 1959*

*Nutritional excess in infancy and childhood. W. A. Cochrane.—p. 454.

**Allergy in Canada.** Much of Canada has been carefully surveyed for airborne allergens and more will be done. Food allergy is relatively common and presents no unusual features. Fish sensitivity is probably more common in the maritime provinces. Owing to a highly organized and extensive distribution system, most of the population has a highly varied diet, and there are few notable seasonal or special food problems. Drug sensitivity is becoming more common or more frequently recognized and differs little from that seen elsewhere. In Canada, it is probable that about 60 per cent of respiratory allergy is due to inhaled and environmental allergens or food. The remainder, the so-called intrinsic factors, have a high degree of infectious factors.

**Treatment of Arthritis with Niacin.** Five patients with varying degrees of arthritis were given daily doses of nicotinic acid and nicotinamide of about 1 gm. per 50 lb. body weight.

Remission of the arthritis was noted in all. Discontinuance of the dosage resulted in return of the symptoms. It is suggested that this treatment also be tried in the treatment of gout since nicotinic acid decreases the excretion of uric acid.

**Nutritional Excess in Children.** The control of infections and increased knowledge of nutritional requirements have resulted in a marked improvement in the health and growth of children. However, the present era is also conducive to overnutrition because of widespread promotional advertising and the general availability of potent dietary supplements. Optimal nutrition for the growing infant and child will, therefore, remain a challenge. The physician, dietitian, and nutritionist must be aware of the possible harm from excess ingestion of all food substances by the young growing organism. It is possible that future pediatric care may be concerned as much with nutritional excess as with nutritional deficiency.

## CEREAL CHEMISTRY

*Vol. 36, September, 1959*

*Treatment of wheat with ionizing radiations. IV. Oxidative, physical, and biochemical changes. S.-P. Lai, K. F. Finney, and M. Milner.—p. 401.

**Irradiation of Wheat.** The treatment of wheat with ionizing radiation was studied. Drastic damage to the starch fraction of flours milled from these wheats was indicated by a decrease in gelatinization viscosity and starch content, and an increase in maltose value. Protein hydration capacity decreased. Carotenoid pigment of the flour was reduced. Baking trials indicated progressive damage to loaf volume and crumb grain, texture, and color with increasing irradiation. Optimal baking performance could be obtained only with the addition of sugar and malt. Bread flavor decreased linearly with increasing radiation damage.

## CHILDREN

*Vol. 6, September-October, 1959*

*Intercultural communication in technical consultation. A. Yankauer.—p. 174.

**Intercultural Communication.** An American pediatrician in India reflects on problems of intercultural communication in technical consultation after spending two years there. He points out that application of skills and knowledge may clash with culturally conditioned values. Therefore, the technical consultant must try to learn, understand, and emphasize the strong points and superior values of the culture in which he works as well as the one from which he derives. He must at least be aware, and make others aware, of his own and his culture's fallibility.

## FEDERATION PROCEEDINGS

*Vol. 18 (Supplement No. 3), July, 1959*

*Advances in human nutrition. Proceedings of the Heinz International Symposium on Nutrition.

**Advances in Human Nutrition.** The proceedings of the Heinz International Symposium on Nutrition held in October, 1958, are presented in this special supplement. This symposium was opened with a session devoted to "The Growing Process," in which the nutritional requirements of the growing human organism and their unique variations with age and with disease were discussed. The pregnant and lactating woman was considered by Dr. S. M. Wishik, nutrition in infancy by Dr. P. György, nutrition in childhood and adolescence by Dr. J. L. Wilson, and children with various metabolic disorders by Dr. H. Shwachman.

The next session included six papers on "Nutrition and Health Problems in Middle Age" with emphasis on artherosclerosis by Drs. I. H. Page, M. Hegsted, and others. Dr. R. E. Olson discussed obesity, and Dr. A. Marble the advances related to diabetes. It was concluded that most of the malnutrition in our country is one of overabundance rather than one of insufficiency.

Malnutrition as a global problem opened the third session, followed by two papers on protein malnutrition. This program also featured two papers on basic research, one on sugar and the other on advances in the knowledge of protein and amino acid requirements.

A panel discussion on nutrition education concluded the symposium and included, among others, such speakers as Adelia M. Beeuwkes, Dr. Willard J. Jacobson, Dr. Miriam E. Lowenberg, Dr. Fredrick J. Stare, and Dr. E. Neige Todhunter.

## FOOD AND NUTRITION NOTES AND REVIEWS (Australia)

*Vol. 16, March and April, 1959*

*Preservation of food in the home by freezing. N. C. Wright.—p. 25.

*Vol. 16, May and June, 1959*

*Infant feeding simplified. R. A. MacMahon, J. M. Woodhill, and R. M. Gibson.—p. 45.

**Home Freezing.** This article gives complete coverage of home freezing. A short history of freezing foods is presented, followed by the nutritional value of frozen foods. What foods can be frozen, preparation of fruits and vegetables—including tables with step-by-step instruction — packaging, thawing, and cooking of frozen foods are discussed. A table on the maximum storage for safety is presented.

**Infant Feeding.** This article is written by a dietitian and the physician in charge of a well-baby clinic in New South Wales. Since 1951, infant feeding has been based on the following principles: (a) The infant is fed on the demand feeding system. (b) The concept of overfeeding is not recognized. (c) Full-strength cow's milk is advocated as a suitable food for infants. (d) Solids are introduced early. (e) The wishes and personality of the mother are always taken into account. These principles are discussed, and it is pointed out that there has been controversy concerning the first three points. Nevertheless, babies from this clinic have had satisfactory growth and general health. An attempt has been made in this article to account for the origin of the previous complicated systems.

## FOOD TECHNOLOGY

*Vol. 13, September, 1959*

Time-temperature tolerance of frozen foods. XIX. Ready-to-cook cut-up chicken. A. A. Klose, M. F. Pool, A. A. Campbell, and H. L. Hanson.—p. 477.

*Control of exudation in prepeeled French-fry potatoes with antibiotics. F. J. Francis, B. L. Amla, and A. Kiratsous.—p. 485.

*Some factors influencing radiation induced chemical changes in raw beef. O. F. Batzer, R. A. Sliwinski, L. Chang, K. Pih, J. B. Fox, Jr., D. M. Doty, A. M. Pearson, and M. E. Spooner.—p. 501.

*Consumer preferences for beef of different breeds related to carcass and to quality grades. M. Dunsing—p. 516.

*Light destruction of riboflavin in partially-baked rolls. L. C. Stephens and M. F. Chastain.—p. 527.

*A comparison of the methods for applying Acronize chlortetracycline to beef. M. C. Firman, H. J. Bachmann, F. J. Heyrich, and P. F. Hopper—p. 529.

**Prepeeled French Fries.** The exudation of liquid from prepeeled potatoes on storage is undesirable because it reduces shelf-life and produces an unsightly and unsanitary appearance. It can be minimized by adding 10 p.p.m. oxytetracycline or chlortetracycline to the sulphite dipping solution of French-fry style strips packed in polyethylene bags. Both antibiotics were equally effective at 38°F. and at 50°F., but shelf-life was much shorter at the higher temperature. Oxytetracycline was effective, even with potato strips inoculated with spoilage organisms from a previous pack.

**Radiation-Induced Changes in Raw Beef.** When hot melt, diacetin fat, and agar with added plasticizer were used in coating fresh meats, microbial proliferation was retarded, but the meats had an undesirable color. A layer of plasticized agar did not prevent excessive drying unless the meats were also overwrapped with film. Incorporation of chlortetracycline into Pliofilm delayed microbial growth and maintained desired surface color of meat longer than did the film alone. An inverse relation was shown between keeping time and storage temperature.

**Preserving Effect of Salt in Meat.** The minimum level of sodium chloride capable of preventing toxin production in perishable meat was studied. Toxin formation by *Cl. botulinum* was observed in inoculated, perishable cured meat with no organoleptic degradation of the product. Marketing of a perishable product, the mishandling of which could result in *Cl. botulinum* toxin formation without warning to the consumer, could constitute a public health hazard. The data suggest that the level of salt must be within the range wherein botulism toxin formation is attended by obvious organo-

leptic breakdown (below 6.25 per cent brine). Alternatively, the salt level may be such that toxin formation is inhibited (about 9 per cent).

**Beef Preferences.** Preference evaluations of a consumer household panel for steers differing in breed and grade were obtained. Preferences were more closely related to quality than to carcass grade. Visual preferences were not related to breed except for color, the darker-color steaks of the Holstein being preferred. Eating preferences were significantly related to breed and grade. The quality grade grouping, however, gave a better indication of the effects both of breed and grade than did the carcass grade grouping. Eating preferences tended to be reversed for the wholesale cuts; they were in favor of Holsteins for steaks from the short loin cut and of Herefords for those from the sirloin cut. Average differences for the over-all preference categories indicated that for Herefords, the degree of preference was highest for tenderness; for Holsteins, for taste.

**Effect of Storage and Cooking on Antibiotic Residues in Meat.** To determine the residual chlortetracycline in meat after storage and cooking, ground beef was treated to contain 1.7, 5.0, or 15.0 mcg. per gram antibiotic. After about 28 hr. at 42±2°F., the residue in the raw meat was about 66 per cent of the amount originally added. Residues in the cooked ground meat decreased as the final internal temperature was increased. At any given temperature, residues were a direct function of the initial concentration in the raw ground meat. In frankfurters, the greatest loss occurred during commercial processing. Only about 15 per cent of the chlortetracycline added in the meat emulsion was detected in the raw frankfurters. After cooking the frankfurters in boiling water at 181°F., the antibiotic concentration was reduced approximately 50 per cent. Thus processing and cooking resulted in a total inactivation of 85 to 95 per cent of the chlortetracycline in frankfurters. Regardless of treatment level or temperature attained during cooking, the antibiotic was not reduced to undetectable amounts.

**Riboflavin Destruction in Partially Baked Rolls.** Yellow and orange cellophanes were tested for effectiveness in reducing photolysis of riboflavin in partially-baked rolls. Both wraps increased riboflavin retention as compared with clear cellophane. The orange afforded greater protection than the yellow. However, riboflavin losses were small, even in the control sample. It is unlikely that the riboflavin lost in partially-baked rolls is of nutritional importance.

**Acronizing Methods Compared.** Effectiveness of chlortetracycline for extending the shelf-life of beef was demonstrated and various methods for applying it were compared. In the amounts used, chlortetracycline was most satisfactory when administered by both an intravenous injection immediately before slaughter and as a spray immediately after slaughter. In order of decreasing effectiveness were the injection, the spray, and finally the treated Cellophane methods of application.

## JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

*Vol. 7, September, 1959*

*Food—space age problem. A staff report.—p. 600.

*Recent developments in foods from cereals. W. F. Geddes.—p. 605.

*Mineral elements in fresh vegetables from different geographic areas. H. Hopkins and J. Eisen.—p. 633.

**Food and Space Travel.** This article, concerning methods of feeding the astronauts, is extremely interesting. It is felt that the engineering problems concerned with space flight are more nearly solved than the biologic problems of the astronaut. There seem to be two possible solutions for feeding. One, the man can carry his food with him. Since storage and weight will be at a premium, this will not do for long flights. Unless water can be recycled, i.e., by recovering urinary wastes, there is little advantage to dehydration. The second solution is to produce food along the way in the closed system. Photosynthetic plants would convert the astronaut's exhaled carbon dioxide into available oxygen, and human wastes would provide nourishment for the plants' growth with energy coming from light. The use of algae is theoretically possible, but there are many difficult engineering problems which must be solved before it becomes a reality. Algae need light, must be aerated, and must be made into an acceptable food. Although algae are potentially a nourishing food, there is objection to a one-food diet. It is felt that the closed ecologic system probably will not be the astronaut's sole source of food, but rather that it will provide a supplement to his diet.

**Developments in Cereal Foods.** Although the sale of flour and other primary products of the milling industry to the homemaker has fallen off, milling companies now supply the homemaker as well as institutions with many different products in the form of dry, refrigerated, and frozen mixes. Commercially baked products also are becoming more in demand. This article discusses developments in the baking industry, including fungal enzymes in bread to improve the crumb, the use of brews rather than the sponge in baking bread, chemically leavened "instant bread," and special products made from wheat, such as bulgur, which has culinary uses similar to those of rice. Supplementation of cereal products is reviewed, and improvements in corn starch and rice are also considered.

**Minerals in Vegetables.** The concentration of ten elements in nine fresh vegetables collected in the Washington, D. C., wholesale market is reported. Marked divergencies between different producing areas were found for the sodium content of lettuce and onions and for manganese in carrots and celery, among others. Copper and manganese in sweet corn showed statistically significant differences between means for individual lots grown on the same farm and illustrate the problems inherent in reporting averages for highly variable elements for a given producing area.

## JOURNAL OF THE AMERICAN GERIATRICS SOCIETY

*Vol. 7, September, 1959*

*Radioactive fat absorptive patterns in the geriatric patient. D. Berkowitz, D. M. Sklaroff, and W. Likoff.—p. 741.

*Vol. 7, October, 1959*

*The action of chlorotrianisene (TACE) with androgen on nitrogen retention in elderly people. W. B. Kountz, T. Kheim, J. Toro, P. G. Ackermann, and G. Toro.—p. 757.

**Absorption of Fat in Old Age.** Fat metabolism, specifically in old age, has been inadequately studied. Radioactive fat was used to investigate the problem. Fat tolerance tests were performed on twenty-five apparently healthy geriatric patients and on twenty-five who had previously suffered a myocardial infarction. Fat tolerance in general was similar to that in younger subjects with comparable disease states. It is postulated that age *per se* does not influence fat tolerance. Impairment may indicate some abnormality in lipid metabolism which could well have preceded the attainment of old age.

**Estrogen, Androgen, and Nitrogen Retention.** Earlier studies by these investigators have shown that androgens, especially testosterone, play a significant role in nitrogen retention in older people and that under certain circumstances other hormone substances, including estrogens, assist in this retention. It has also been shown that estrogens, when administered alone, have little influence. In this study, chlorotrianisene (trademarked TACE), which behaves like estrogen, was observed with stilbestrol as well as with testosterone in a nitrogen balance project. TACE with the above androgens increased nitrogen retention; a decrease in nitrogen retention was noted with TACE alone. It is concluded that the combined androgen-estrogen medication, or even androgen alone, stimulates nitrogen retention and improves the clinical status in elderly patients, even when their dietary protein intake is adequate.

## JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

*Vol. 171, September 5, 1959*

*Penicillin and other antibiotics in milk. Council on Drugs.—p. 49.

*Vol. 171, October 3, 1959*

*Role of heredity, diet, and emotional stress in coronary heart disease. H. I. Russek. —p. 503.

*Food intake by loggers. Questions and Answers.—p. 628.

*Frozen baby foods. Questions and Answers. —p. 631.

**Antibiotics in Milk.** The failure of some dairy farmers to withhold from the market milk from animals that have been recently treated for mastitis by intramammary infusion of penicillin preparations, together with their abuse of such preservatives by direct addition to milk, has created a public health problem. Consumers who are allergic or may be sensitized to variable small amounts of penicillin are thus exposed to this drug in the milk supply. Other antibiotics for similar use do not appear to constitute a similar hazard. Current federal labeling regulations require that milk from treated animals not be used up to 72 hr. after the last treatment, and that single doses of penicillin not exceed 100,000 units each. The Department of Health, Education, and Welfare does not have adequate evidence to prohibit totally the use of antibiotics in animals. Such further measures may be required if malpractice persists. The elimination of other antibiotic contaminants of milk, although desirable, appears to be less urgent.

**Coronary Heart Disease.** In recent years many investigators have sought to unravel the complex relationship between the incidence of clinical coronary disease and nutrition, physical exercise, overwork, emotional stress, and the use of tobacco and alcohol. Even in carefully designed epidemiologic studies, these factors are not easily separable. In a group of 100 coronary patients, prolonged emotional strain associated with job responsibility preceded the attack in 91 cases, as compared with 20 for the control group. Taking 91 in relation to 20 or 4.6 as a ratio measuring the importance of occupational stress, this author obtains comparable ratios of 2.7 for diet, 2.0 for tobacco, 1.7 for heredity, 1.3 for obesity, and 1.0 for lack of physical exercise as suggesting the relative importance of these factors in causing coronary heart disease in this group of patients.

**Food Intake by Loggers.** Studies done on the food consumption of loggers located in the Pacific Northwest and Great Lakes region in 1943 revealed a range of calories from 5311 to 6507. The National Research Council recommends that loggers be placed in a category of workers requiring more than 5500 calories per day. The decreased food intake noted after decreased physical effort due to mechanization is in accordance with the hemostasis of energy metabolism. Since the requirement for protein is relatively uninfluenced by the amount of physical work, it would be entirely physiological for loggers to cut down automatically on high-calorie carbohydrate and fat foods, but not protein foods.

**Frozen Baby Foods.** No manufacturer is know who produces frozen baby foods. At the recent National Packaging Exposition, it was reported that frozen precooked baby foods in aluminum pouches may be available in supermarkets by the end of the year. It is not known why such products have not appeared on the market before, but the cost factor probably is greater in the freezing process.

## THE JOURNAL OF CLINICAL INVESTIGATION

*Vol. 38, August, 1959*

*Evaluation of nicotinic acid as an hypocholesteremic and anti-atherogenic substance M. Friedman and S. O. Byers.—p. 1328.

*Dietary fats and the diurnal serum triglyceride levels in man. P. F. Kuo and J. C. Carson.—p. 1384.

*Human pantothenic acid deficiency produced by omega-methyl pantothenic acid. R. E. Hodges, W. B. Bean, M. A. Ohlson, and R. Bleiler.—p. 1421.

**Niacin Hypocholesteremia.** Ingestion of niacin by the rat did not alter the rate of intestinal absorption of cholesterol or total lipid, the rate of hepatic synthesis of cholesterol, or the biliary secretion of bile acid. When the intake of a high fat-cholesterol diet was controlled in both the treated and control animal, the ingestion of niacin did not hinder the expected onset of hypercholesteremia. The previously observed hypocholesteremic and atherosclerosis-preventing properties of niacin acid may be due to an anoreutic effect. The possible influence of this substance on both the quantity and quality of food eaten by human subjects under noncontrolled conditions is discussed.

**Fats and the Serum Triglyceride Levels.** The diurnal variations in serum triglyceride, cholesterol, and phospholipid levels of ten subjects on isocaloric full diets, rice-and-fruit diets, and 50 to 70 per cent corn-oil-formula diets were determined. In all subjects, diurnal serum cholesterol and phospholipid variations were minimal. In four subjects with normal lipid metabolism and two with "pure" hypercholesteremia, the postprandial serum triglyceride elevations were lower and briefer with the corn-oil diet than for a typical American (full) diet. These differences in the effects of unsaturated and saturated dietary fats on postprandial serum triglyceride concentration became progressively less evident in four patients with increasingly severe hyperlipemia. While on the rice-and-fruit diet, fasting serum triglycerides of the nonlipemic subjects were only slightly higher than their respective fasting levels measured during the full and corn-oil-formula dietary periods. However, mean diurnal serum triglyceride levels of these subjects were low with the rice-and-fruit diet. In hyperlipemic patients, significant increases in their fasting serum triglyceride concentrations were observed, following the change from high-fat diets to the rice-and-fruit diet.

**Pantothenic Acid Deficiency.** Four healthy young men were fed a balanced 3200-calorie diet containing 120 gm. protein. One served as a control while the other three received different amounts of the antagonist, omega-methyl pantothenic acid. The control subject and the man who received the smallest amount of antivitamin remained in fairly good health. The subject on an intermediate dose developed gastrointestinal and neurologic symptoms characteristic of pantothenic acid deficiency. The fourth man, who received the largest dose, remained asymptomatic except for the development of tremor. Biochemical abnormalities were found in the eosinopenic response to adrenocorticotropic hormone (ACTH) of the two men who received the most antagonist and in the sensitivity to insulin of the man who received 2 to 4 gm. daily. It is concluded that daily administration of 2 to 4 gm. omega-methyl pantothenic acid induced clinical and metabolic changes consistent with pantothenic acid deficiency even though a normal diet was fed. This illness was corrected by administration of the active vitamin on cessation of antagonist dosage.

## JOURNAL OF HOME ECONOMICS

*Vol. 51, September, 1959*

*The current situation and trends pertinent to the future development of food and nutrition. C. J. Personius.—p. 577.

**The Future of Food and Nutrition.** The author discusses the current situation and trends pertinent to the future of food and nutrition. During the past fifty years, programs of food and nutrition have been designed to help people appreciate the relationship between nutrition and health and to help them attain optimal nutrition. The nature of an adequate diet has changed within this time, as has also the pattern of food consumption. The food activities of the homemaker of tomorrow yet may be difficult, but the author feels that whatever the form of food products or the facilities available for preparation, people will still need help in attaining optimal nutrition, and the professional home economist can be expected to have an increasingly important role in the food industry. Technologic developments will in no way decrease the importance of an understanding of the relation between nutrition and health.

## JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

*Vol. 33, August 1, 1959*

*Serum cholinesterase and alkaline phosphatase leve's and serum protein fractions in entamoeba histolytica infections. R. M. Kasliwal and R. K. Sogani.—p. 81.

**Liver Function Tests in Amebiasis.** In early and even moderately advanced liver involvement in amebiasis, the routine liver function tests have failed to indicate liver derangement. In this paper, serum cholinesterase, serum alkaline phosphatase, and serum protein fractions were studied in normal controls and in patients with amebiasis. Serum cholinesterase fall was quite frequent in amebiasis and associated with tender hepato-

megaly and was more frequent in patients with amebic liver abscess. There was no alteration in alkaline phosphatase levels in amebiasis, with or without hepatitis. There was a rise in this level only when there were large amebic abscesses of the liver. There was slight, but not significant fall in total serum protein in amebiasis.

### JOURNAL OF J. J. GROUP OF HOSPITALS and GRANT MEDICAL COLLEGE (India)

*Vol. 4, July, 1959*

*A study of serum amylase activity in normal adult Indian males. E. D. Bharucha, R. N. Joshi, and A. Venkataraman.—p. 174.

**Serum Amylase Activity.** The determination of serum amylase activity is important in diagnosing acute nonhemorrhagic pancreatitis, wherein high values may be found early in the course of the disease. Low values of serum amylase activity are also important in diagnosis. This study was done to learn the normal range for serum amylase activity in normal adult Indian men. Eighty-two of the one hundred studied were within the range of 50 to 89 units, with an average value of 61.5 units.

### THE JOURNAL OF NUTRITION

*Vol. 68 (Supplement 2), July, 1959*

*A nutrition survey of the armed forces of Pakistan. Prepared at the request of the Interdepartmental Committee on Nutrition for National Defense. C. E. French *et al.*

*Vol. 69, September, 1959*

*Vitamin K deficiency in rats induced by the feeding of irradiated beef. V. C. Metta, M. S. Mameesh, and B. C. Johnson.—p. 18.

*The site of action of lactose in the enhancement of calcium utilization. F. W. Lengemann.—p. 23.

*The effect of radiation sterilization on the nutritive value of foods. V. On the amino acid composition of milk and beef. W. S. Tsien and B. C. Johnson.—p. 45.

*Nitrogen balance of young adults consuming a deficient diet supplemented with torula yeast and other nitrogenous products. J. A. Goyco.—p. 49.

*Amino acid balance and imbalance. II. Dietary level of protein and lysine requirement. S. M. Munaver and A. E. Harper.—p. 58.

*Biological availability of amino acids in fish meals and other protein sources. L. E. Ousterhout, C. R. Grau, and B. D. Lundholm.—p. 65.

*The effect of nitrogen intake upon the urinary riboflavin excretion of young male adults. J. M. Smith, S. D. C. Lu, A. Hare, E. Dick, and M. Daniels.—p. 85.

**Nutrition of the Armed Forces of Pakistan.** The principal aims of this survey were to appraise the nutritional status of the armed forces of Pakistan and to assist the Pakistanis in establishing a nutrition service. Rejection of recruits on medical grounds for all of Pakistan has been high, and much cause of rejection has resulted from nutritional disease. In general, the data from dietary, biochemical, and physical examinations indicate adequate nutrition with regard to calories, protein, iron, thiamine, and niacin. Calcium and riboflavin intakes were both slightly low, but no signs of clinical deficiency were seen. Vitamin A findings were variable, and serum ascorbic acid levels were low in most troops. A high incidence of goiter was found. These and other problems, such as nutrient analyses before and after cooking of many native vegetables for which there are few reliable data, are under further study.

**Vitamin K Deficiency and Irradiated Beef.** Consumption by growing rats of diets containing irradiated beef resulted in internal hemorrhages and prolonged prothrombin times. Generally the female rat did not show this syndrome. The lesion was induced by freshly irradiated beef as well as irradiated beef which has been stored for over six months at room temperature. Supplementation with vitamin K prevented the hemorrhagic condition.

**Lactose and Calcium Utilization.** Although inclusion of lactose in the diet has long been recognized as a means of improving the utilization of calcium, the mechanism by which this is accomplished has remained obscure. Previous investigators suggested that lactose participated in some manner with the bone cell. These experiments were initiated to test this suggestion. It was concluded that the site of action of lactose is in the intestine and not within the body, such as the bone cell.

**Radiation and Amino Acids.** The effect of irradiation at 2.8 million, 5.6 million, and 9.3 million rad levels on the amino acid composition of milk and beef was studied. Glutamic acid, aspartic acid, serine, and glycine were most seriously reduced by irradiation in both milk and beef.

**Torula Yeast and Nitrogen Balance.** The main limitation of torula yeast protein appears to be its low content of available methionine. The results of nitrogen metabolism studies performed on young Puerto Rican men consuming a diet typical of low-income groups are reported. The subjects on the unsupplemented basal diet maintained nitrogen equilibrium. Supplementation with torula yeast improved nitrogen retention slightly. Torula yeast plus DL-methionine induced a greater retention. Skim milk as a supplement produced the greatest retention. The significant improvement in nitrogen balance whenever DL-methionine was the supplement indicated that the protein of the basal diet has as a limiting factor, methionine.

**Amino Acid Balance.** There is evidence that the requirement for the most limiting amino acid in a diet rises as the dietary level of protein is increased. This aspect was studied in the rat, using wheat gluten, which is deficient in lysine. Wheat gluten is so poorly balanced in amino acids that the lysine requirement of the rat for maximum growth was increased when this protein was the sole source of dietary lysine. An analogy has been drawn between this effect and those observed as a result of amino acid imbalances.

**Availability of Amino Acids.** A new chick assay method is proposed in this paper for the estimation of essential amino acids available to the animal from various protein sources. The material to be tested is fed as a supplement to a diet replete of all essention amino acids except the one being tested. Thus the source supplies this one as well as non-essential amino acid needs. The growth response to this diet, compared with that for the same diet plus the missing amino acid, allows estimation of the amino acids furnished by the protein source. Interactions among dietary ingredients present the major problem with this method. Advantages of the method are discussed, and results of tests with nineteen protein sources are given for a number of amino acids, with special emphasis on fish meals.

**Nitrogen Intake and Urinary Riboflavin.** A constant riboflavin intake was maintained throughout four nitrogen variations in diet. As the nitrogen balance became more positive and as dietary and urinary nitrogen increased, the urinary riboflavin decreased. The relationship between urinary riboflavin and nitrogen were interpreted on the basis of labile and stable protein reserves with the assumption that the flavoproteins may be part of the labile rather than stable protein. Before attempting to set a requirement for riboflaviin on the basis of urinary riboflavin excretion, the intake of protein and the nitrogen balance must be considered.

### THE JOURNAL OF PEDIATRICS

*Vol. 55, September, 1959*

*A role for tocopherol in human nutrition. H. M. Nitowsky and H. H. Gordon.—p. 315.

**Tocopherol in Human Nutrition.** The findings of low plasma tocopherol, increased hemolysis of erythrocytes in dilute hydrogen peroxide, increased urinary and plasma creatine in patients with steatorrhea, and their reversal with tocopherol administration in patients with cystic fibrosis of the pancreas constitute evidence for the existence of a tocopherol deficiency in the human subject. This is supported by postmortem findings of focal lesions in the skeletal muscles and of ceroid pigment in gastrointestinal smooth muscle of patients with cystic fibrosis of the pancreas and congenital biliary atresia. Although these lesions are not specific, they are characteristic of tocopherol deficiency in animals. The findings of low plasma and body tocopherol and increased hemolysis of erythrocytes in newborn infants, both full term and premature, warrant continued study.

### THE LICENTIATE (India)

*Vol. 9, July, 1959*

*Rational use of dairy products. Ghee. T. M. Paul.—p. 127.

**Ghee.** This author from the National Dairy Research Institute of India discusses the rational use of dairy

products, specifically ghee. He states that ghee, if produced from animals fed on green fodder and processed properly, is a good source of vitamins A and D. However, ghee loses a great part of its vitamin A content during heating, particularly when used for frying. As ghee has a desirable flavor, it is often used in this way. He stresses that it should be used on the table, and raw or refined oils be used for cooking.

## NURSING OUTLOOK

*Vol. 7, August, 1959*

*How wisely do students select their diets? G. Labecki and S. Merrow.—p. 471.

**Student Diets.** Administrators of nursing schools have long been concerned about the adequacy of the students' food intake and how much the intake is influenced by changes in the work schedules in the clinical areas. A three-year study was instigated in an attempt to determine the adequacy of basic nursing students' intake of ascorbic acid, vitamin A, and protein in their diets under the most optimal circumstances possible to induce proper food intake. A discussion of the criteria used and the results of the study are presented. In conclusion, they voiced the opinion that, "Instruction in food and nutrition and availability of adequate food may not provide a sufficient motivation for selection of a diet which will provide the Recommended Dietary Allowances of protein and ascorbic acid. The apparent tendency of the average intake of vitamin A and protein to decrease during the nursing school period merits further investigation."

## NEW ENGLAND JOURNAL OF MEDICINE

*Vol. 261, August 27, 1959*

*The effects of long-term administration of tolbutamide to (alloxan)-subdiabetic rats. A. Lazarow and B. Treibergs.—p. 417.

*Chlorpropamide therapy of diabetes: An appraisal. R. C. Stewart, E. U. Piazza, H. Hyman, III, and D. Hurwitz.—p. 427.

*Dietary fats and the diabetic patient. L. W. Kinsell, G. Walker, G. D. Michaels, and F. E. Olson.—p. 431.

*Cases of diabetes of long duration. H. C. Hagedorn.—p. 442.

**Tolbutamide in Sub-Diabetes.** Tolbutamide in doses of 500 mg. per kilogram body weight per day administered by stomach tube twice daily to sub-diabetic rats impaired the tolerance to glucose. This impairment persisted throughout the twelve-month period of administration. Tolbutamide administered to sub-diabetic rats in doses of 200 mg. per kilogram per day produced less change in glucose tolerance. In the normal rat, prolonged administration likewise impaired the tolerance to glucose. The administration of the drug did not push sub-diabetic rats into frank diabetes. Amelioration of the diabetic state previously observed in untreated animals during the second year of the disease was likewise observed in rats during tolbutamide treatment (500 mg. per kilogram of body weight per day).

**Chlorpropamide Therapy.** Chlorpropamide, a new hypoglycemic agent for oral administration, was tested in fifty patients in the Diabetes Clinic of the Boston City Hospital. The drug was effective in 54 per cent of cases of adult-onset diabetes. Excellent control was achieved in 33 per cent—greater than that observed when the same patients were on insulin or tolbutamide. The more prolonged action is an obvious advantage over tolbutamide. When twenty-two of the patients received a placebo, only two had equivalent control. Toxic side effects occurred in four patients (8 per cent), being quite severe (exfoliative dermatitis and jaundice) in two. Fifty additional patients on chlorpropamide for at least two months have shown no toxic reactions. Chlorpropamide has proved to be an effective hypoglycemic agent. Further evaluation of toxicity and long-term effectiveness of this drug is necessary.

**Dietary Fats and the Diabetic Patient.** A dietary approach to the problem of vascular disease in the diabetic patient is outlined. This approach is based on well documented observations that diets containing relatively large amounts of polyunsaturated fat, modest amounts of carbohydrate, adequate amounts of protein, and limited amounts of saturated fat are associated with normal levels of blood lipids. It is hoped that the maintenance of such blood lipid levels will have value both prophylactically and therapeutically with respect to atherosclerosis and diabetic retinopathy-nephropathy. Recent observations indicate that substitution of polyunsaturated fat for saturated-mono-unsaturated fat is also associated with better diabetic management in terms of blood sugar levels.

**Diabetes of Long Duration.** A follow-up study of the first eight Danish diabetic patients treated with insulin in 1923 has been made. One died within the first two days of the insulin treatment. One died twenty-two years later of cancer, at seventy-four years of age. One died of coronary occlusion at fifty-two years of age, twenty-eight years after the beginning of the insulin treatment. Five patients are still alive, with an average duration of diabetes of forty-one years and a period of insulin treatment of thirty-six years. Four of these have normal vision. One has been operated on for cataract, two have minimal retinal lesions, and the fifth is living abroad and is known to have impaired vision but is still living an active life.

## NEW YORK STATE JOURNAL OF MEDICINE

*Vol. 59, August 1, 1959*

*Nutrition for the noningesting patient. W. E. Abbott, H. Krieger, and S. Levey.—p. 2911.

*The span from rat to man. R. H. Barnes.—p. 2931.

**The Noningesting Patient.** To provide complete nutrition, it is necessary to supply all the constituents needed to form new tissue. These include water, calories, protein or protein hydrolysates, electrolytes, and vitamins. For the noningesting individual with no defect in the gastrointestinal tract which would preclude the presence of foods, such materials can be given either by nasogastric tube or, if necessary to feed such a patient for a long period of time, the routes created by a gastrostomy or jejunostomy. For individuals who cannot be fed via the gastrointestinal tract, intravenous feedings should be employed. Fluid and electrolyte abnormalities usually are best treated by this method. With modern nutritional preparations it is now possible to supply adequate amounts of nitrogen, calories, water, and electrolytes solely by the intravenous route.

**The Span From Rat to Man.** Emphasis has long been given to the important advances in medical science that have stemmed from animal experimentation. On the other hand, investigators should be aware of the frequent lack of correlation between man and his experimental model. If an understanding of a disease process or a treatment of that disease is sought, the answer can only come from the clinical patient. Such examples of lack of correlation should emphasize the need for the investigator to establish firmly the fundamental cellular or subcellular biochemical metabolic phenomena involved. Then, as he utilizes the intact animal to seek non-metabolic possibilities that might cause species differences, he can extend his studies to a wider assortment of animals in the hope of finding parallelisms that will be helpful.

## NUTRITION REVIEWS

*Vol. 17, Supplement, August, 1959*

*The analysis of fatty acid mixtures by gas-liquid chromatography: Construction and operation of an ionization chamber instrument. J. W. Farquhar, W. Insull, Jr., P. Rosen, W. Stoffel, and E. H. Ahrens, Jr.

*Vol. 17, September, 1959*

*Status of irradiation preservation of foods. H. E. Robinson.—p. 257.

**Analysis of Fatty Acid Mixtures.** The purpose of this report is to describe the application of gas liquid chromatography (GLC) to the analysis of complex mixtures of fatty acids and, in addition, to provide details on the construction and operation of an exceedingly sensitive apparatus for GLC. This instrument has proved dependable in laboratory operation for more than a year. The entire apparatus, including an ionization chamber detector, can be constructed from readily available components, utilizing the mechanical and electronic skills generally available to research establishments.

**Irradiation Preservation of Foods.** Changes induced by radiation vary

greatly with the food in question and with the amount of radiation used. The following are changes involved in food acceptability: flavor, (resembling scorching), color (both darkening and bleaching), and textural (especially with fruits and vegetables). Changes also occur during storage of foods, due to action of agents not controlled by radiation, including enzymes and chemicals. Other aspects of irradiation are discussed, including the problem of enzymes, the concern of radioactivity, and the forms of radiation used. Much more basic research needs to be done to establish radiation preservation as a workable food process.

## PUBLIC HEALTH REPORTS

*Vol. 74, September, 1959*

*Wax used for milk and food containers. A. S. Flemming.—p. 831.

**Waxed Containers for Milk.** Since there has been question about possible cancer-producing agents in wax used for milk cartons and other food containers, a thorough investigation of these waxes was undertaken. The results of these studies have been reviewed by scientists of both the Public Health Service and the Food and Drug Administration. Although the findings are not final, no indications of a health hazard have been found. The Food and Drug Administration advises that, under the Food, Drug, and Cosmetic Act, there is, at present, no basis for action concerning these waxes. The scientists are also agreed that more information is needed.

## SCIENCE

*Vol. 130, September 18, 1959*

*Average potassium concentration of the human body as a function of age. E. C. Anderson and W. H. Langham.—p. 713.

*Vol. 130, September 25, 1959*

*The most poisonous poison. C. Lamanna.—p. 763.

**Body Potassium as Function of Age.** Potassium-40 measurements of over fifteen hundred males and females ranging in age from less than one year to seventy-nine years showed sex differences and age trends in the ratio of muscle mass to the mass of other body constituents. A sex difference first appears at approximately twelve years of age. While girls show a continuous decrease in potassium concentration, boys show a rapid increase between the ages of fourteen and sixteen. During adult life, both sexes show a persistent and parallel decrease, which may be related to physiologic aging. It is suggested that measurement of potassium-40 may offer an effective, statistical means of studying some aspects of the physiology of aging, exercise, starvation, and such wasting diseases as muscular dystrophy.

**Botulism.** There are five types of toxins that cause botulism, but studies have been concentrated on type A toxin, which is most frequent in human beings and particularly in North America. The chemical nature of botulinal toxins is discussed. It is certain that the toxins are simple proteins. Botulinal toxins are the most potent poisons known, and as yet it is impossible to state lethal doses. The toxins are oral poisons, and it is felt that the small intestine is the major site of systemic absorption. A paralysis of the efferent autonomic nervous system occurs, resulting in interference with breathing and in terminal asphyxia. How the toxins escape the alimentary tract and the exact nature of the mechanism of synoptic poisoning is not known. Botulinal toxoids have been developed, but no need has yet existed for immunizing large numbers of people. There is still much to be learned concerning the botulinal toxins.

## SOUTH AFRICAN JOURNAL OF LABORATORY AND CLINICAL MEDICINE

*Vol. 5, June, 1959*

*Controlled trial of the protein value of a maize/pea vegetable mixture for pre-school children. A. S. Truswell, J. D. L. Hansen, H. E. Schendel, and J. F. Brock.—p. 63.

**Protein Value of a Vegetable Mixture.** The protein efficiency of a mixture of pea flour and maize meal was studied using pre-school orphanage children as subjects. A control group received porridge made with spray-dried nonfat milk, while the experimental subjects received a porridge made from the maize/pea vegetable mixture. The maize/pea mixture only approached adequacy, when it was the sole source of protein in healthy, older children with good appetites. The nutritional value of the protein in this vegetable mixture appeared to be less than in the maize/milk control diet.

## THE TOHOKU JOURNAL OF EXPERIMENTAL MEDICINE

*Vol. 69, April 25, 1959*

*Diets and progress of alloxan diabetes. T. Saito, A. Wakui, and A. Ohneda.—p. 307.

**Diets and Alloxan Diabetes.** These investigators have previously shown that a high-protein, high-fat diet in normal rats contains a diabetogenic factor. This present work studies the effect of different diets on the progress of diabetic rats induced by alloxan administration. The progress of diabetic symptoms was improved favorably in the group on the standard diet, but deteriorated both in the glucose tolerance and histologic studies in the group on a high-protein, high-fat diet. It is felt that the standard diet which contains the three main foodstuffs in well balanced proportion is superior to others in treating alloxan diabetic animals.

## ADULT EDUCATION

*Vol. 9, Summer, 1959*

*Continuing education and individual responsibility. T. H. Carroll.—p. 239.

**Continuing Education.** "A vigorous society cannot exist without vigorous individuals, and individuals cannot remain vigorous without continuing education." The author considers some of the fundamental changes during the last twenty-five years which suggest the importance of continuing education for social responsibility. He asks, "How can the executive keep up-to-date?" The first requirement is a "liberal" education, one which gives broad interests, a grasp of analytical techniques, and modes of thought which will enable the executive to continue his development beyond formal schooling. The second requirement is to enroll in a formal education program. The author describes many of the commercial and governmental programs which have been instituted to assist executives to continue their formal education.

---

## ADULT LEADERSHIP

*Vol. 8, September, 1959*

*Is group process a cure-all? E. Sargent, Jr.—p. 67.

*Developing discussant skills in adult education courses. F. R. Dowling.—p. 80.

**Group Process.** There are considerable differences of opinion as to the value of group process, discussion, group dynamics, or conference leadership. The author feels that the "group process" approach has a basic core, regardless of which group uses it. Many believers in group-process techniques argue that a denial of the process is a denial of the democratic process, and the author agrees. In defining the group process, he states, "An important concept that must be accepted by all is the recognition that group process cannot be substituted for authority and responsibility." The author also stresses the need of the conference leaders and conferees for skill in using the techniques of the group process.

**Developing Discussant Skills.** Most adult education courses are taught by the discussion method. However, the author points out that, "You'll probably find a considerable number of the most competent teachers neglecting two rather obvious needs; a neglect which actually nullifies their own carefully developed ability to teach through the discussion method. First, the instructor fails to make the students aware of the discussion skills needed to participate ably in the course. And, second, he fails to provide some basic training in the use of these skills." The author outlines a plan for training adults to become more efficient in discussing topics.

## COLLEGE AND UNIVERSITY BUSINESS

*Vol. 27, September, 1959*

*The right answer at Dickinson is outside management of food service. G. Shuman, Jr.—p. 46.

*Vol. 27, October, 1959*

*Here are arguments for and against contract feeding. E. B. Heilman.—p. 52.

**Contract Feeding.** "As colleges ex-

pand in service and in capacity and as new facilities providing for food service spring up, the question of college *versus* professionally managed services is being asked with frequency." The demand today is for more variety and better food. Food service problems and the lack of ability to solve them can be blamed on many specific factors, and poor management is one of the easiest items on which to pin these problems. The author recommends that a formal study be made of an operation to determine objectively the needs and problem areas. The author presents many of the pro and con arguments for on-campus management or food service by contract.

**Outside Management.** Food service at most colleges is part of the educational package, but this college decided to separate the two and employ a food service management concern. This decision was based on wanting to offer the students food of the right kind and also wanting relief from every problem connected with food service, from purchasing and management to the selection and training of service personnel. However, the college still wanted to be able to determine its food costs a year in advance. The author discusses how outside management has satisfied food service, personnel, and cost requirements in the past eight years.

## HOSPITALS

*Vol. 33, September 1, 1959*

Central ingredient room simplifies food preparation and cuts costs. K. E. Flack.—p. 125.

*Vol. 33, October 1, 1959*

*6 steps for improving employee selection. D. E. Wallace.—p. 86.

**Employee Selection.** Seven years ago, a Pittsburgh hospital had an employee turnover rate of 105 to 108 per cent in the dietary department. Last year, the rate was reduced to 37 per cent. This was partially accomplished by eliminating split shifts. In addition considerable effort was put into improving training and supervision. Also, a formal program of employee selection was instituted consisting of the following six steps: (a) developing job specifications, (b) recruiting, (c) screening, (d) interviewing, (e) reference checking, and (f) selecting. Each step is discussed.

## INPLANT FOOD MANAGEMENT

*Vol. 6, September, 1959*

*30 ways to use frozen French fries for profit. —p. 33.

*You've got to feed 'em but where are they and who are they? S. L. Wolfbein.—p. 37.

*Cheese brings the cheers!—p. 60.

**French Fry Tricks.** French fried potatoes are popular throughout the plant, from the errand boy to the gentlemen with carpeted offices. This article gives thirty menu-brightening and imaginative ways to serve frozen French fries which add convenience and profit to the inplant operation.

**Where and Who?** Understanding figures and predictions about tomorrow's labor force can help you to plan today's food service facilities. An interview with the Assistant Secretary of Labor presents some of the answers and much upon which to speculate and plan for the future.

**Cheese.** Descriptions of many types of cheeses and suggested menu uses are given. The article familiarizes an imaginative manager with the variety in cheeses available on the market so that he may develop his own variations.

## INSTITUTIONS

*Vol. 45, September, 1959*

*Seafood specialties for children.—p. 7.

*Current trends in cafeterias.—p. 11.

*The ideal waitress. Letters. K. E. Montague. —p. 16.

*It takes management to please young patrons. —p. 53.

*A short course in kitchen design. Part IX: Specifications for cooking equipment. J. Laschober.—p. 69.

*Planning a personnel program.—p. 134.

*"The burden being shared out." Part IV, The five processes in the management cycle. H. S. Dorsey.—p. 158.

*School lunch is business affair. K. T. Phillips.—p. 184.

*Vol. 45, October, 1959*

*Fight fire before it starts.—p. 12.

*The executive looks at food service. M. Kolinchak.—p. 22.

*A short course in kitchen design. Part X: Dish handling procedures, Section I. J. Laschober.—p. 30.

*Tests that tell when to purchase new equipment.—p. 36.

**Friday Problem for Schoo's.** Friday presented a costly, time-consuming problem in one school because of the operations involved in preparing fish for the cafeteria. With the advent of a streamlined freezer-to-fryer-to-plate operation which utilizes breaded ready-to-cook fish portions, the problem was solved. And fish is popular: more than half of the 1200 student and teacher diners select it in one Ohio senior high school. Suggestions for serving food which is interesting and economical to students and a recipe for "shrimp-in-a-bun" are presented.

**Cafeteria Trends.** "No type of food service lends itself to greater variation than cafeteria-style." It is little wonder that some of the most interesting modern innovations are occurring in cafeterias. "It is because of the many points of view on cafeteria design and operation that the editors have undertaken an extensive survey of the most recent trends which will be discussed in issues to follow." The first article leads off with detailed sketches of interesting counter layouts found among winners in the 13th Food Service Contest. In addition, floor plans of four representative, prize-winning cafeteria operations are featured.

**The Ideal Waitress.** Speaking from the patron's point of view, the author of this letter to the editor outlines a list of traits which she would like to find in a waitress.

**Catering to Young Folk.** "Food service plays a major role in the total education of students. The problem is much more than providing three good meals a day. Not only do well balanced meals spell the difference between success and failure in the classroom, but also the manner in which the meals are served—the many 'extras' that are possible—can combine to make mealtime an anticipated experience." This article describes many of the services and management programs featured by a food service management concern.

**Cooking Equipment Specifications.** The type of menu, volume of business, and, finally, choice of fuels are some of the factors which must be considered before a competent decision can be made about the actual selection of cooking equipment. "The decision between gas and electricity as the main cooking fuel will depend upon the evaluation of such factors as employee preferences and maintenance problems, as well as cost." The amount and type of equipment required for a given operation will depend entirely on the style of menu and expected volume of business. Examples are given which indicate the cooking units recommended for typical installations. Pointers on selection and installation of equipment are also presented.

**Personnel Program.** Automation does not delete the most important factor in production—the working man. It is the principal job of management to develop effective programs to use our labor resources. "The basic problem is to conserve manpower and to get from it the best possible utilization." Excerpts from a speech given by Dean M. M. Hargrove of the University of Tulsa include the objectives of business and labor when planning a personnel program.

**Basic Processes in Management.** "Management is the process of getting things done through men, money, materials, and machines—or some combination of these factors." The manager must accomplish the job through the efforts of others; and to do this, he must perform five basic processes: planning, organizing, directing, coordinating, and controlling. The author briefly outlines the factors involved in each process. A more detailed consideration of the many and complex facets of *planning* and *organizing* are introduced in this article which comprises parts four and five of his series.

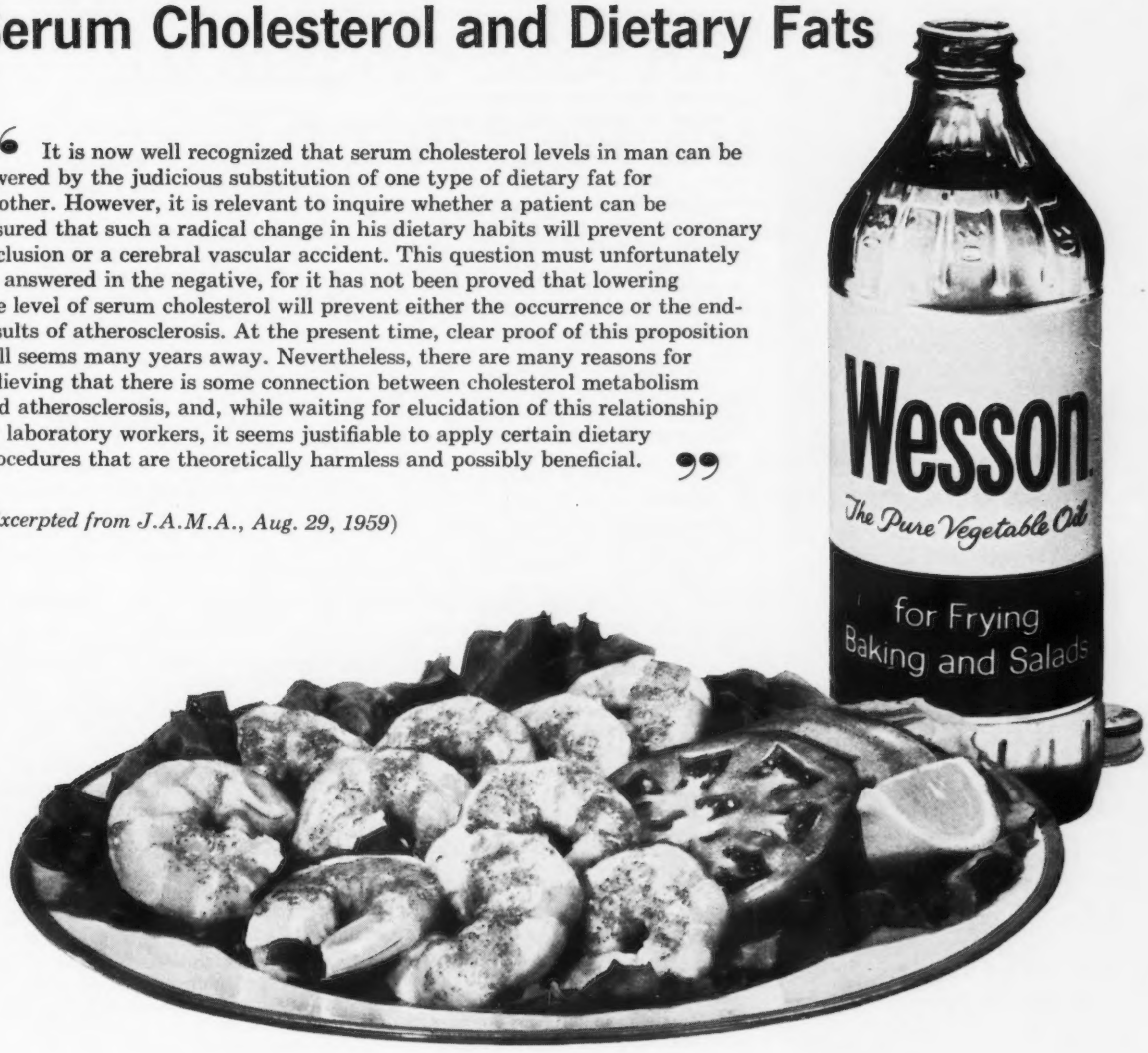
**The School Lunchroom — A Business.** The necessities and details of managing a school lunchroom as a business proposition are outlined. A detailed discussion includes such aspects as: personnel relationships, labor, the plant, evaluation of surroundings, the importance of instructions, cleanliness and sanitation, safety, health, buying, inventories, and some axioms on food and cooking.

**Fire Factors.** For an effective fire protection program, institution operators must (a) take precautions to prevent all fires and (b) have the necessary equipment and a program for bringing small fires under control

# A Significant Statement about Serum Cholesterol and Dietary Fats

"It is now well recognized that serum cholesterol levels in man can be lowered by the judicious substitution of one type of dietary fat for another. However, it is relevant to inquire whether a patient can be assured that such a radical change in his dietary habits will prevent coronary occlusion or a cerebral vascular accident. This question must unfortunately be answered in the negative, for it has not been proved that lowering the level of serum cholesterol will prevent either the occurrence or the end-results of atherosclerosis. At the present time, clear proof of this proposition still seems many years away. Nevertheless, there are many reasons for believing that there is some connection between cholesterol metabolism and atherosclerosis, and, while waiting for elucidation of this relationship by laboratory workers, it seems justifiable to apply certain dietary procedures that are theoretically harmless and possibly beneficial."

(*Excerpted from J.A.M.A., Aug. 29, 1959*)




**Where a poly-unsaturated oil is called for in the diet, Wesson satisfies the most exacting requirements (and the most exacting appetites).**

To be effective, a diet must be *eaten* by the patient. The majority of housewives prefer Wesson,* particularly by the criteria of odor, flavor (blandness) and lightness of color.

**Uniformity you can depend on.** Wesson has a *poly*-unsaturated content better than 50%. Only the lightest cottonseed oils of highest iodine number are selected for Wesson, and no significant variations in standards are permitted in the 22 exacting specifications required before bottling.

Each pint contains 437—524 Int. Units of Vitamin E.

**Wesson's Important Ingredients:**

| | |
|---|---|
| Linoleic acid glycerides | 50% to 55% |
| Phytosterol (predominantly beta sitosterol) | 0.4% to 0.7% |
| Total tocopherols | 0.09% to 0.12% |

*Never hydrogenated—completely salt free*

*Reconfirmed by recent tests against the next leading brand with brand identifications removed, among a national probability sample.

SANITARY
and
SALUTARY

Buy-words for modern hospital food service and . . .

SYRACUSE *China*

Syracuse is high-fired, vitrified china fused to a lustrous steel-hard glaze to prevent crackling and crazing . . . resist chipping and breaking . . . protect against scratches and absorption of bacteria . . . withstand extreme heat without harm to surface or decoration. Really hospital clean—as only china can be!

And only Syracuse offers such a host of beautiful patterns and shapes . . . china that enhances food appeal, insures fuller measure of meal-time pleasure and helps speed patient recovery. Truly salutary, really sanitary!

Investigate these and many other important benefits-in-use of famous Syracuse China. Write today for color brochure of Syracuse's "Hospitality Group" of stock patterns including the new space-saving "Trend" shape shown above.

SYRACUSE CHINA CORP.
SYRACUSE 4, N.Y.

before they can become big ones. In this first part of a series, the seven deadly sins against fire protection are listed, and three of them are discussed. The factors involved in a study of big fires are presented in chart form with suggestions for avoiding or correcting these conditions in a proposed, new, remodeled, or existing institution.

**Sizing up a Food Service.** Executives and administrators are frequently asked to appraise the excellence of food service operations. "If they know the 'signs' or 'indicators,' they can make a valid evaluation even though they have little or no technical background in food service itself." This article breaks down the technical side of food service into basic components or conditions and, for each, sets forth a common denominator which tends to reveal the general state of the operation.

**Dish Handling Procedures.** In this tenth article in a series, the author discusses the proper washing and sterilizing of soiled dishes. Recommendations for the design of the soiled dish table, disposer units (including the bowl or hopper to which it is connected and disposer drain piping), and the centralized disposer unit are given.

**Replacement of Equipment.** "Every equipment replacement program should have a definite plan of procedure, not only to protect the financial security of the establishment but to make certain the proper step is being taken at that specific time." A list of factors has been compiled which should be weighed whenever and wherever the food service operator decides a specific unit of equipment may need replacement.

## THE MODERN HOSPITAL

*Vol. 93, September, 1959*

*Catering turns complaints into compliments. B. Shelby.—p. 116.

**Catering Compliments.** The food service in a Highland Park, Illinois hospital had been the target of monotonously negative comments from patients until a catering service entered the scene. A chef-manager now handles the cooking, purchasing, personnel training to a degree, and inventory while the dietitian supervises the therapeutic aspects of the dietary service. The author points out the advantages realized by employing a catering service which are substantiated by patients' glowing reports.

## NRA NEWS

*Vol. 2, September, 1959*

*Basic principles of food prepaartion. Part I—Meat cookery. J. A. Cline.—p. 19.

**Meat Cookery.** The basic principles of food preparation, brought out in this discussion of meat cookery, were the result of years of research conducted in the laboratories and experimental kitchens of many government agencies, universities, colleges, food industries, and also in some restaurants. The objects in cooking meat are: (a) to change the color of the meat, (b) to retain and develop the natural flavor of the meat, and (c) to make the meat tender, if necessary. In this discussion of the principles of meat cookery, the author covers shrinkage of meat in cooking, cooking methods, and the advantages of constant low temperatures.

## PERSONNEL JOURNAL

*Vol. 38, September, 1959*

*Achieving competence as the boss. R. N. Hilkert.—p. 130.

*The error-correction talk. R. Magee.—p. 134.

*Position descriptions: Living or dead? J. L. Cross.—p. 137.

**Achieving Competence as Boss.** A first vice president in a bank discusses some problems of an executive and how to handle them. The importance of communication, job-delegation, and decision-making is considered. Most failures, he feels, are in the areas of personnel administration, human relationships, and general administration. He lists five essential and desirable characteristics of business leadership: technical competence; a broad, intellectual outlook; a highly developed sense of humor; a concern for the public interest; and an understanding and appreciation of human relationships.

**The Error-Correction Interview.** Every supervisor has occasion to correct an employee. This paper discusses the ground rules for conducting a corrective interview. The rules are: (a) Get the facts. (b) Choose the right time and place. (c) Correct rather than blame. (d) Let the employee look at the error. (e) Find how to avoid repetition of the error. (f) Strengthen responsibility toward the job. It is felt that these rules will not only remove much of the "error" found in the typical error-correction talk, but will greatly aid the over-all growth, development, and efficiency of one's human work force.

**Position Descriptions.** This article describes the manner in which a company has used position descriptions to form the basis for an analysis of inter-responsibility among the executives. How this worked out is explained in detail, and a position description form is included. One of the many advantages was a more effective team effort.

## RESTAURANT MANAGEMENT

*Vol. 35, September, 1959*

*Before you buy insurance . . . are you covering your risk? A. C. Emerson.—p. 49.

*Training tips for top personnel. E. J. Clinton.—p. 54.

**Insurance Covering Your Risk?** "Restaurant operators are growing more aware of insurance both as a cost of doing business and as a means of economic protection." A basic understanding of its function and a knowledge of its limitations and use are essential to the wise purchase of insurance. Points discussed include: the place of insurance in the restaurant; understanding insurance require-

# The Nutrient Value of LOW-PRICED CUTS of Meat

It is a common misconception that the higher-priced cuts of meat are "more nourishing" than the lower-priced cuts.

The fact is that all lean meats—beef, veal, lamb, and pork—supply approximately the same quantity of high efficiency protein, as well as a significant complement of B vitamins and essential minerals. One low-priced meat, lean pork, exceeds all other high protein foods in its content of thiamine.

Each of the low-priced cuts of lean meat listed below is approximately equivalent to the most expensive cuts of lean meat in content of protein, B vitamins, and minerals such as iron, potassium and phosphorus.

**BEEF**

*Steaks:* chuck, shoulder, flank, round, rump.
*Pot roasts:* chuck ribs, cross arm clod, round, rump.
*Stews:* neck, plate, brisket, flank, shank, heel of round.

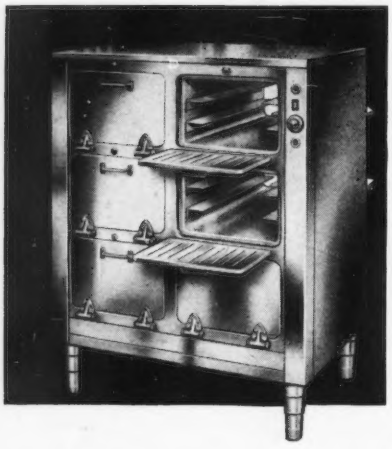
**LAMB, PORK AND VEAL**

*Chops, roasts, pot roasts and stews* made from shoulder, breast, and shank meat.

Dishes prepared with these low-priced cuts of meat are among the most delectable. Furthermore, meat, because of its outstanding nutritional value, is an ideal food to recommend in high protein diets in both health and disease without burdening the food dollar.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

American Meat Institute
Main Office, Chicago...Members Throughout the United States



**Thermotainer®**
**will feed 300 from less than 8 SQUARE FEET**

Type CPT Thermotainer's huge capacity easily accommodates eighteen 12" x 20" x 2" pans of various prepared hot food. This is ample capacity for storing one meat ccurse and two vegetable courses needed to serve 300 diners. But, Thermotainer's capacity is only a small part of the story.

Equally important is Thermotainer's amazing ability to keep hot foods in perfect condition for serving. Because Thermotainer has exclusive "channel heat" to maintain uniform compartment temperature and humidity, food is kept hot and delicious for hours. Uses no steam or hot water. Even the most delicate foods never become soggy, dried out, or lose their flavor.

These and all the other exclusive Thermotainer features including the original pass-through design help you double kitchen output without doubling food preparation equipment.

***Write for catalog illustrating more than 75 types and sizes.***

***Sold only through authorized dealers.***

**FRANKLIN PRODUCTS CORP.**
400 W. Madison Street Chicago 6, Ill.

ments; determining specific insurance requirements; how much to insure; and other salient points.

**Training Top Personnel.** The author warns that in a personnel training program, one should not overlook his own aides-in-chief, namely, his managers and assistant managers. Some important points with respect to the training of the upper echelon of personnel are that: (a) they should receive a copy of your policies and handbook; (b) work under your own personal direction, reporting to you regularly; and (c) proceed from department to department, working for varying periods of time in all departments and areas of your operation. The author discusses in detail each of these phases of training middle-management personnel.

## SCHOOL LUNCH JOURNAL

*Vol. 13, September, 1959*

*The employee's role in sanitation. M. S. Ross and R. O. Gilbert.—p. 22.

*Safe storage of food supplies. C. R. Barden. —p. 29.

*Cleaning large equipment—food flavor protection. M. Merrick and N. M. Hathaway.—p. 33.

*Rodent and insect control. H. Gunderson.—p. 37.

*Cleaning with acid detergents. H. C. Jasper. —p. 44.

*Prevention of spoilage in cooked foods. K. Longrée.—p. 50.

*Making food handling safe. A. H. Kenyon. —p. 56.

*Bacteria in food spoilage. D. D. Jewel.—p. 60.

*Sanitation supervision and management. M. R. deMarco.—p. 64.

*Effective hand dishwashing procedures. H. C. Giles.—p. 66.

*Modern pot and pan washing methods. R. Iverson.—p. 68.

*Nutrition blueprint for teen-agers. F. V. Hein.—p. 74.

*Vol. 13, October, 1959*

*New dimensions in supervision. M. Barnard. —p. 14.

**Employee's Role in Sanitation.** The rapid increase in the number of school lunch programs in the last twenty-five to thirty years has brought with it many problems, especially with respect to proper sanitation equipment and procedures. The author provides recommendations to insure the adherence to the basic essentials in sanitation as it is related to the employees of the school lunch program.

**Safe Storage.** "All the care exercised in the preparation of safe food can be offset dramatically through poor food storage practices." The author discusses many aspects of proper food storage and presents a list of foods and storage facilities and how they should be used for prime safety.

**Cleaning Large Equipment.** The difficult task of cleaning large equipment to insure the protection of food flavor is discussed. A check list is presented which gives the factors to be considered. "Although we would like to have a single 'miracle' cleaning material to solve all our cleaning problems, the fact remains that since soils are different, chemical cleaners must be different." In setting up an effective cleaning program, the authors suggest the necessary basic steps.

**Rodent and Insect Control.** By knowing the habits of pests and by using common sense, you can prevent loss and food contamination from them. The author describes the characteristics of rats and mice; roaches and flies; beetles, moths, and mites. Advice is given on the prevention and control of these pests.

**Acid Detergents.** Acid detergents are an important group of common chemicals having specific values in fighting alkaline soil. The acids are classified as either inorganic or organic. The mineral (inorganic) types are strong, corrosive, and dangerous to handle. Organic acid cleaners (vegetable base) offer a completely new approach to the control of watermarks and lime formation in the institutional, dairy, and food processing fields. The author discusses the advantages of organic acid cleaning compounds and tells where, when, and how to use them.

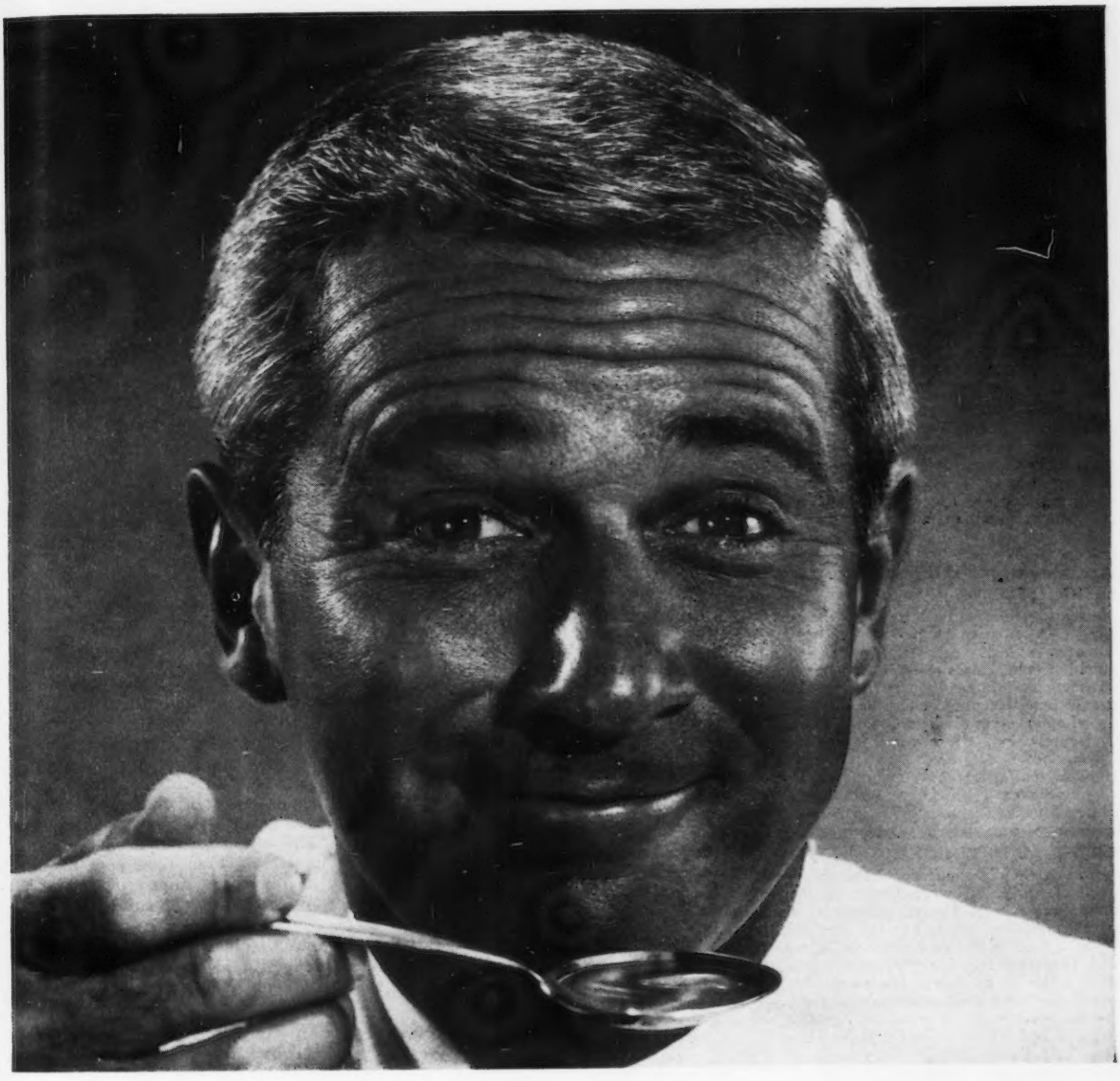
**Cooked Food Spoilage.** "The prevention of spoilage of cooked foods in institution kitchens and refrigerators requires that employees who handle the food understand how food may become contaminated, understand under what conditions microorganisms may grow profusely, and what they can do to reduce the chances of contamination and further growth of the contaminating germs." Each of these aspects of preventing food spoilage is discussed with suggestions for carrying out such a program.

**Safe Food Handling.** "Maintaining the safety of our food supply is one of the most important obligations of all who have anything to do with the preparation, storage, shipment, and serving of food products." The author discusses this topic in relation to the work done by the Food and Drug Administration. He reviews the responsibility of food service personnel in preventing food poisoning and cites the dangers that may result from improper handling and processing of foods.

**Food Bacteria.** "It is unfortunate that the food requirements of harmful bacteria are about the same as the food requirements of human beings." The author examines the development of the bacteria that cause food poisoning and gives suggestions for its prevention.

**Sanitation Program.** "Top management is directly responsible, legally and morally, for establishing a quality sanitation program within an institution." A practical and comprehensive program entails informed supervision, trained employees, clearly outlined methods, quality products, and follow-up inspections. Such a comprehensive sanitation program is outlined.

**Hand Dishwashing.** The author lists and discusses a variety of cleaners, sanitizers, and techniques with respect to proper sanitation practices. He also outlines the basic fundamentals and



# SAVOR THE FLAVOR

## *of the world's best soup*

Nothing braces an appetite like a brisk bowl of aromatic chicken soup – and nothing makes as delicious a bowl of soup as Custom Pure Chicken Soup Base. Easy to use? You bet! Just mix with piping hot water. Stir for just a moment . . . Ah, rich, golden chicken broth . . . made from only choice U. S. Grade A chicken meat roasted with Custom's own secret process to preserve *all* its goodness.

GOES SO FAR, IT MAKES EXTRA PROFITS FOR YOU, TOO.
WRITE FOR KITCHEN TESTED RECIPE BOOKLET. JA-129

Custom **FOOD PRODUCTS, INC.,** 701 N. Western Avenue, Chicago 12, Illinois

**NUTRITION IN HEALTH AND DISEASE**
**NEW 13TH EDITION**

*Cooper, Barber, Mitchell and Rynbergen.* A major revision reflecting the rapid progress in nutrition, foods and diet therapy, and incorporating the newest research findings. Emphasizes the significance of good nutrition in health and disease, and the scientific and clinical adaptations which contribute to the educational background of the nurse. The presentation is simple, concise, authoritative and readily adaptable to correlated teaching patterns. Many illustrations, learning aids, study questions, charts and reference lists. 734 Pages, 143 Illustrations and 5 Color Plates. 1958. $6.00

**HISTORY OF THE AMERICAN DIETETIC ASSOCIATION, 1917-1959**

*Barber.* The first official history of the ADA. Follows the fortunes of the Association from its inception in 1917. Besides discussing the role of the dietitian from ancient times to the Space Age, it is a complete record of the Association's origin, structure, aims and accomplishments. A book every dietitian and ADA member will be proud to own. 328 Pages, 50 Illustrations. 1959 $6.00

**BASIC NUTRITION**

*McHenry.* A modern approach to the college level nutrition course written by an authority with 30 years' experience in the nutrition field. Gives essential information on methods of nutritional investigation, energy requirements, composition of foods, the vitamins, special diets and their practical application. *"More useful information is contained in this book than is generally found in similar textbooks for university or nursing students."—J.A.M.A.* 389 Pages, 9 Illustrations, 22 Tables. 1957 $5.00

**PRACTICAL NUTRITION**

*Peyton.* A complete nutritional text for the practical nurse, dietary assistant or food service supervisors. Covers all aspects of normal nutrition, prenatal to old age; diet therapy, food economics, nutritive values, food preparation and many other topics. Many tables of great practical value. "... *one of the few current sources of information on basic nutrition which is readable, practical and sound."—Food and Nutrition News.* 379 Pages, 32-Page Supplement, 41 Illustrations. 1957 $4.00

**BREADS, WHITE & BROWN**

*McCance & Widdowson.* Describes the economic significance of white and brown breads and their place in history, and surveys experiments made to compare nutritional values of various types of bread. 174 Pages. 1956 $5.00

**J. B. Lippincott Company**
**East Washington Square, Philadelphia 5, Pa.**
**In Canada:**
**4865 Western Avenue, Montreal 6, P.Q.**

*Please enter my order and send me:*
☐ **NUTRITION IN HEALTH AND DISEASE—NEW 13TH EDITION.....$6.00**
☐ **HISTORY OF THE AMERICAN DIETETIC ASSOCIATION, 1917-1959 .....$6.00**
☐ **BASIC NUTRITION .....$5.00**
☐ **PRACTICAL NUTRITION .....$4.00**
☐ **BREADS, WHITE & BROWN.....$5.00**

Name.....
Address.....
City..... Zone..... State.....
☐ *Charge* ☐ *Payment Enclosed*
☐ *Convenient Monthly Payments*
JADA-12-59

the proper procedures for manual dishwashing.

**Pot and Pan Washing.** The pots and pans in the kitchen are as important to good sanitation as the dishes on which food is served. Thorough cleanliness of pots and pans is best obtained by following well-established schedules of cleaning. Also, the storage of utensils should not be overlooked.

**Teen-Age Nutrition Blueprint.** The author asks how the school can help youth achieve maturity in health behavior. "Contrary to some ideas, secondary school youngsters do take an interest in health and its nutritional aspects. But their interests in health and eating practices differ considerably from those of adults as well as from those of younger age groups. These interests are 'built-in' motivations toward health education, including nutrition, if we will but recognize and use them." The author discusses many of these factors and recommends the use of the "essential four" as a teaching aid.

**Supervision Defined.** "Supervision in this age is *not* a case of one person in a superordinate position with all the answers dictating to those in a subordinate position who do not have the answers." The author suggests eight points for successful supervision. She outlines the basic problem areas in employee supervision and offers specific recommendations for the improvement of human relationships on the part of supervisors.

## VOLUME FEEDING MANAGEMENT

*Vol. 13, September, 1959*

*Mechanical aids cut clean-up time and effort. —p. 20.

*Sea-food. E. Blair.—p. 22.

*Layout and equipment ideas. Interchangeable sections add flexibility to mobile units. O. Webber.—p. 53.

*A glamorized garnish.—p. 58.

*Freshen up your menu with fruit.—p. 66.

*Spot check system pegs cost-per-portion served.—p. 108.

*Vol. 13, October, 1959*

*"Make employees important . . . "—p. 32.

Clean equipment is low-cost flavor insurance. M. Merrick.—p. 50.

*Hard-working recipe system.—p. 61.

*Weighing equipment. Product evaluation report.—p. 80.

*75 causes of high food costs. P. Dukas.—p. 94.

**Clean-Up Mechanics.** Well adapted equipment and cleaning compounds that are matched to the job speed clean-up for the 3600-meal-a-day operation which is described. The types of equipment used and the processes for cleaning dishes and glassware, pots and pans, and silverware are discussed.

**Seafoods.** Seafood offers almost unlimited variety for cooking, presenting, and serving. "There is no excuse for serving seafood dishes that are humdrum and dull." A few remedies offered by the author are: to vary the kinds of fish and shellfish that are offered; to differ the preparation by featuring broiled, baked, poached, and steamed fish as well as the more usual fried; and to use seasonings, sauces, stuffings, relishes, and garnishes as variables. Charts on suggested ways of serving fish and methods of preparing many varieties are given, in addition to a list of garnishes and many recipes.

**Employee Importance.** Employees of a highway restaurant receive recognition on two levels: (a) for actual performance and (b) as individual members of a successful team. This has built a remarkably effective personnel policy. The first part of the program is to provide financial incentive for the waitress in the form of a commission for extra sales. Weekly meetings are another phase of the employee relations to give them a sense of participation in the over-all operation of the restaurant.

**Recipe System.** A Los Angeles chain of cafeterias is cutting food preparation costs and improving quality with a "tested recipe" system. The system is designed to put a firm foundation under every item of food served. Instructions for making the item, the approximate number of servings, the approximate yield in pounds, preparation time, method of service, and related recipes are all included on each standardized recipe card.

**High Food Costs.** The problem of food costs has many dimensions and, very often, the relationship of food cost to sales is lost in the complexity of recording the details of food cost alone. The author gives seventy-five basic causes of high food cost. The list is an organized digest of replies given by successful restaurant operators.

**Flexible Mobile Units.** Many of the most productive ideas in the planning theories about food service have had to do with mobility. Recent changes in approach to hospital food service problems and the increase in all types of catering, moreover, have created special interest in the development of mobile meal service carts. The author points out a few design flaws found in some of these mobile units and stresses the fact that the greatest need is for true flexibility of use. Ideas are offered as possible solutions to these problems and to give some basis for evaluating mobile equipment. Several sketches illustrate the idea of flexibility in a mobile serving unit.

**Peachy Glamor.** "Some garnishes are mostly attention-getting. Besides filling this role, canned cling peaches add both flavor and body." The article contains a host of ideas for using this bright, cheerful, and edible commodity.

**Menu Freshening with Fruit.** The ways of presenting fresh fruit are practically unlimited, and the recipes given offer some new ideas along with fresh variations of traditional recipes. Each recipe is made with fruits that are lower in cost in the fall because

# Libbey Esquire Tumblers offer

# 4 Big Advantages...

1. "Safedge" glass is guaranteed: "A new glass if the rim of a Libbey 'Safedge' glass ever chips!"

2. Curved side wall design bulges slightly near top, protects rim if glass is turned over.

3. Heavy base, handsome mannish design, make Esquire glasses easy to hold.

4. Esquire Tumblers are available plain or fluted in a complete range of eight sizes.

The attractive shape of Esquire Tumblers adds a distinctive touch to beverage service, and every glass can be decorated with your emblem or motif for added prestige. Esquire assures operating economy, too, because of its amazing durability.

Libbey is the exclusive choice of leading restaurants because it combines customer-pleasing beauty with management-pleasing durability and economy.

For full information on Esquire and all the other economical Libbey patterns, see your Libbey Supply Dealer, or write to Libbey Glass, Division of Owens-Illinois, Toledo 1, Ohio.

**Collins**
**No. 42770, 12-oz.**
(Old No. 259)

**Collins**
**No. 42730, 11-oz.**
(Old No. 226)

**Hi-Ball**
**No. 42620, 9-oz.**
(Old No. 225)

**Hi-Ball**
**No. 42570, 8-oz.**
(Old No. 232)

**Split**
**No. 42500, 7-oz.**
(Old No. 223)

**Seltzer**
**No. 42450, 6-oz.**
(Old No. 251)

**Side Water**
**No. 42380, 5-oz.**
(Old No. 249)

**New Fashioned**
**No. 42490, 7-oz.**
(Old No. 227)

Can be crested with your own crest, trademark, or slogan for added distinction.

LIBBEY SAFEDGE GLASSWARE
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

they are in season. Tips on selecting the best apples, pears, grapes, cranberries, tangerines, casaba, melons, coconuts, and such year-round steadies as citrus fruits, bananas, and avocados are given.

**Spot Check System.** This article tells how four food cost controllers maintain a financial control covering 6 million meals that are spread out over fifteen kitchens and 14,000 mi. It's an airline, naturally.

### WHAT'S NEW IN HOME ECONOMICS

*Vol. 23, September, 1959*

*Skillful food buying requires knowledge. N. Fitch and D. Shank.—p. 76.

*Good food deserves good storage . . . In the refrigerator.—p. 80. . . . In the freezer.—p. 82. . . . On the shelf—p. 84.

*What makes women buy the food they buy? F. J. Lunding.—p. 120.

*Vol. 23, October, 1959*

*A good marketer knows the signs of wholesomeness and quality of food. D. Shank and N. Fitch.—p. 70.

**Skillful Food Buying.** "The need to teach students and young adults how to develop skill in food buying can hardly be overemphasized." Money must be spent wisely to buy nutritious foods. Food buying should take into account present-day habits of family living, and it should take advantage of the constantly increasing number of new foods appearing on the market as a result of research and development. The authors discuss the important factors in skillfull food buying such as: planning meals, keeping aware of food prices, learning to figure cost per serving, learning about forms of food, learning about food quality, and making a market list. The different factors that affect food costs are also reported.

**Good Food Deserves Good Storage.** Three articles discuss how modern developments in food storage have brought about a revolution in the eating and buying habits of this country. "The first phase of this revolution came about when refrigerators were made larger, with provisions for high-humidity storage of fresh foods and short-term storage of frozen foods." The many advantages of refrigerators and the proper storage for different types of foods are discussed. The second phase of the revolution in American food habits came with the freezer. Factors of proper freezer storage and its advantages are discussed. The third article deals with suggestions on how best to store foods on the shelf. These articles also tell of some of the newest innovations in refrigerators, freezers, and kitchen shelf and cabinet designs.

**Food Buying Motivations.** Records indicate that people eat a relatively constant amount, measured in calories, year in and year out, in prosperity or depression, under conditions of war or peace. The author states that, "The statistics on food consumption indicate that consumers are becoming progressively more interested in nutritious foods that are not too high in calories and that consumers are willing to step up the quality and variety of the foods they buy as their incomes rise, provided these foods yield more satisfying meals for the family and save drudgery in the kitchen." The author reports that the postwar shift to more expensive foods is evidence that as incomes have risen, consumers have chosen to upgrade their food standard of living. Also discussed are the inferences (derived from statistical trends in the actual consumption of different foods) of why women buy the foods they buy, and outlines of how these are reinforced by studies of the basic psychologic motivations of homemakers.

**Governmental Protection for Food Buyers.** This article is a run-down on the various means through which governmental agencies protect our food supplies. These agencies include: Food and Drug Administration, Public Health Service, and the USDA's Bureau of Animal Industry and the Agricultural Marketing Service. The FDA deals with the problems of food contamination and misrepresentation, while the Public Health Service is concerned primarily with ordinances and codes, among them, the Milk and Ordinance Code. The USDA's agencies are responsible for developing quality standards on which consumer grades for various foods are based. Certain inspection programs serve to enforce the standards established.


For FAST toasting—

to avoid food service delays . . .

there's no substitute for

Savory

Savory's automatic toasting operation makes food service faster, easier and more economical because there's no wait for loading—no delay in toast delivery.

In hospitals, schools and institutions where rigid meal schedules must be maintained, a Savory toaster *keeps pace with demand* by providing 6 to 12 slices of fresh hot toast every minute.

—and Savory toasters are sturdy and easy to clean, too. Made of gleaming stainless steel, they'll serve you for years.

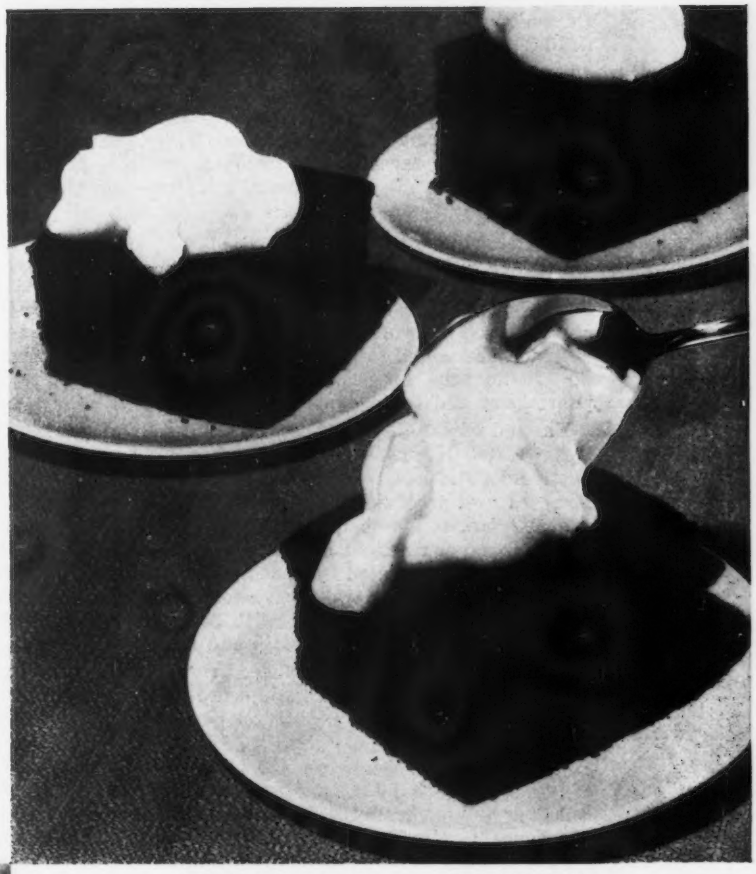
Ask your Kitchen Supply Dealer for details, or write:

Savory EQUIPMENT, INCORPORATED
120 Pacific St., Newark, N. J.

# PET *Instant* and gelatin make the first fat-free, vanilla-flavored WHIPPED TOPPING

## *costs only 1/4¢ a serving!*

Now, at last, a fat-free whipped topping that doesn't have a lemon taste! Instead, a mild vanilla flavor you can combine with almost any dessert. Vanilla Whip has a more pleasing texture, too—velvety consistency, heavier body. And it whips so quickly, easily... holds up longer... costs so little you can use it in your menus daily. Try it on any of the desserts you serve — cake squares, puddings, fruit—for an extra inviting and delicious touch.



**Available in 1-gal., 2-gal., 3-gal., 5-gal., 25-lb. and 50-lb. sizes.**

## VANILLA WHIP

**1½ tsp. unflavored gelatin**
**½ cup boiling water**
**1½ cups PET *Instant* (in dry form)**
**1 cup cold water**
**½ cup sugar**
**1 Tblsp. vanilla extract**

Stir gelatin and boiling water in 5-qt. bowl until gelatin dissolves. Cool to lukewarm. Add PET *Instant* and cold water. Beat with electric mixer at high speed until soft peaks form (2 to 3 min.). Beat in sugar gradually until stiff peaks form (3 to 4 min.). Scrape sides of bowl often. Beat in vanilla. Serve at once or chill about 30 min., then stir gently before topping desserts.

Yield: 2 quarts or 70 servings of 2 Tblsp. each.

**FOR VARIETY . . .** Replace vanilla with ½ tsp. almond flavoring

- Replace cold water with cold pineapple or orange juice and omit vanilla
- Fold in chopped nuts and finely cut maraschino cherries (well-drained)
- Add cut-up or flaked coconut

"PET"—Reg. U. S. Pat. Off. Copr., 1959, Pet Milk Co.

## BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

### Carl Wilhelm Scheele—December 9(?), 1742–May 21, 1786

Carl Wilhelm Scheele had little formal education, but he had a driving interest in the chemistry of the things around him, coupled with an enthusiasm for experimenting. He never had much money, but he was rich in ideas and ability to plan experiments and interpret the results. Thus Scheele was able to exert great influence on the modern chemistry which was emerging from the old alchemy.

Scheele was the fifth son in a family of six boys and five girls. His father was Joachim Christian Scheele, a merchant at Stralsund, the chief town of what was then Swedish Pomerania. Carl Wilhelm was born December 9 (or 19, the date is not certain), 1742, and since his father could not afford much education for his sons, Carl at the age of fourteen, went to work in the pharmacy of Martin Anders Bauch at Gothenburg. The boy was fortunate in his employer who made books available to him and gave him an opportunity to learn chemistry and pharmacy and allowed him to experiment. In 1765, when Bauch sold his business, Scheele went as a clerk to a pharmacy in Malmo. Here he stayed three years; then he moved to Stockholm for two years, followed by five years with an apothecary in Upsala. In this last pharmacy, he was kept too busy to be able to carry on his experiments, and in 1774 he accepted the management of a pharmacy in the small town of Köping about 60 mi. from Upsala. Here he spent the remainder of his short life. He lived only forty-three years and died May 21, 1786, but his discoveries in chemistry were many.

In every pharmacy where Scheele worked, he used every spare minute to experiment; that was his main interest in life. At an unbelievable rate, he filled his notebooks with the records of his experiments and observations and with drawings of his apparatus which was of the simplest kind. He was always critical of what he read and wanted to check for himself. Modest, honest, and simple in character, he had no time for jealousy and conflict with others; he was proud to be a pharmacist and to be experimenting.

The list of his chemical discoveries is a long one, beginning with tartaric acid before 1768. He discovered many acids, including tartaric, citric, malic, lactic, and oxalic, and isolated glycerol (1783). He isolated many inorganic compounds, invented new processes for preparation of others, contributed to plant chemistry and to quantitative chemistry. He produced hydrogen by the action of organic acids on iron or zinc, but his discovery of greatest interest to the nutritionist was oxygen. This he isolated by heating various compounds, such as silver carbonate, mercuric oxide, and saltpeter. Scheele was one of the earliest investigators on respiration. He enclosed a bee with honey as food in a glass over limewater; the water gradually rose in the glass and the bee died in seven days.

Scheele's laboratory notes and correspondence, which were not published until 1892, show clearly that he had discovered oxygen before 1773; this was at least a year before Priestley's work on oxygen was published. Scheele's outstanding publication, *Chemical Treatise on Air and Fire,* described his investigations on oxygen. Although the manuscript was sent to the printer in 1775, he was neglectful of it, and the book did not appear until 1777. Delay in publication robbed Scheele of some "firsts" in chemistry, but his discoveries were many and his influence on the development of this science was marked. The Swedish Royal Academy recognized his eminence in the field by making him a member even before he had found time to pass his examination as an apothecary (1777).

There was no time in Scheele's life for anything but science and pharmacy. At Köping, a widow, Mrs. Pohls, was his housekeeper for ten years. He married her three days before he died so that she might inherit what he possessed and not be in want in her declining years.

Monuments to Scheele were erected in Stockholm, Köping, and Stralsund, and medals in his honor were coined by the Swedish Royal Academy of Science in 1789 and again in 1827. In celebration of the bi-centennial of his birth, Sweden honored his memory with two postage stamps bearing his portrait and signature.

REFERENCES: Urdang, G.: The Apothecary Chemist, Carl Wilhelm Scheele. 2nd ed. Madison, Wis.: American Institute of the History of Pharmacy, 1958; Tilden, W. A.: Famous Chemists. N. Y.: E. P. Dutton and Co., 1921.—*Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

## if it's new, and in our field

# it's KOCH

## here's proof!

**SERIES M:** A flexible, functional reach-in refrigerator designed as a complete food handling system.

**KOCH PAN FILE®:** Exclusive system can store this typical mountain of pans in any one Series M door opening.

**MIX 'N MATCH:** Series M permits infinite combinations of units, designed to tune-up kitchen efficiency.

**MOBILE FOOD FILE®:** Puts cold food on wheels, permits one person to do the work of three. Handles dishes one or a hundred at a time.

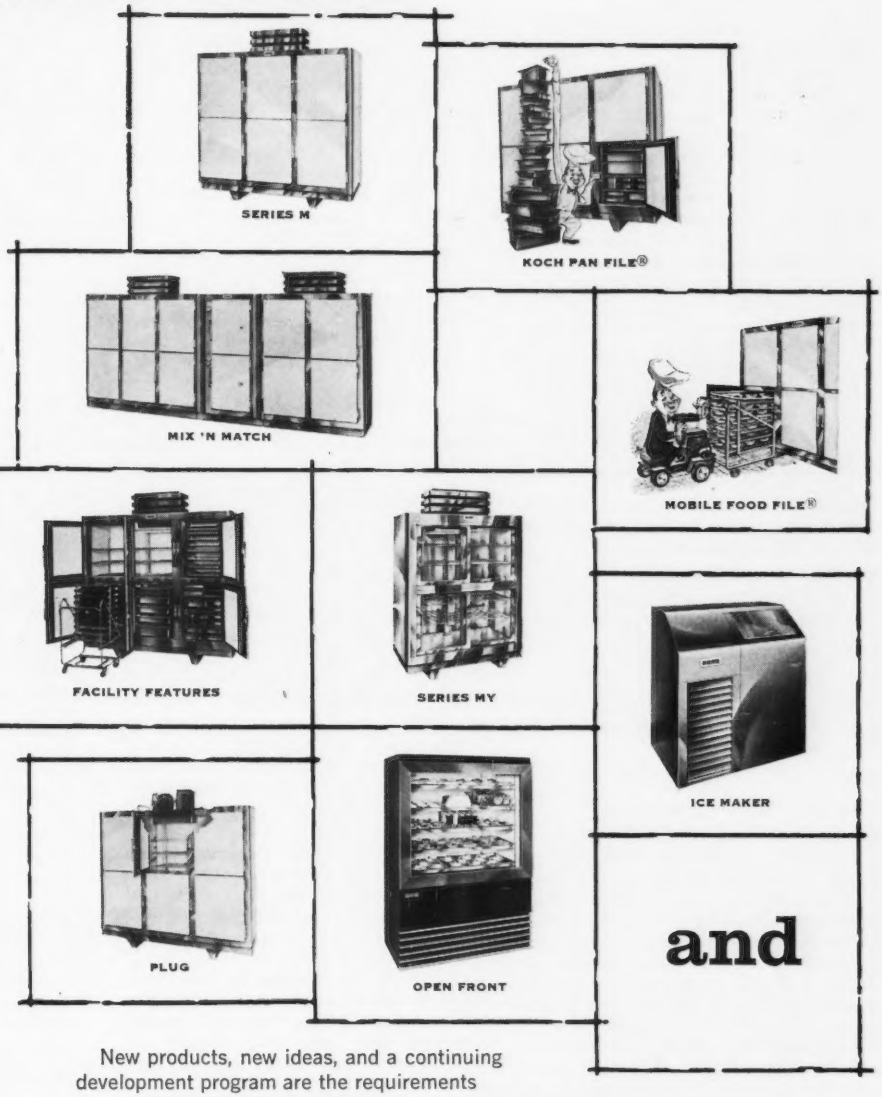
**FACILITY FEATURES:** Food File®, Pan File®, Portion File, Fractional Pan File, Mobile Food File®, Bonus Shelves, Mobile Dolly, Pedestal Legs.

**SERIES MY:** Designed for maximum display, accessibility, and flexibility. In front opening or pass through.

**ICE MAKER:** Patented new system puts an end to moving parts in ice making zone. Produces crystal clear, hard ice nuggets.

**PLUG:** The only unit with a 5-year warranty, that replaces instantly, and that has positive top-to-bottom cooling.

**OPEN FRONT:** Reach-in refrigerator—without front, and with only a thin curtain of cold air between customer and product.




New products, new ideas, and a continuing development program are the requirements of food handling progress.

Koch, through the inspired assistance and cooperation of food consultants, architects, and users in every kind of institutional kitchen, provides you with quality and field proved equipment. Your needs and requirements are reflected in the design and flexibility of Koch products.

Why not consult with your preferred Koch dealer for up-to-the-minute developments in food handling equipment?

**Koch keeps one step ahead of the industry today . . . and creates new ideas for tomorrow!**

SINCE 1883 KOCH refrigerators, inc.
KANSAS CITY 15, KANSAS

**Korean Dietitian Receives Oregon Scholarship.** Miss Il Wha Parks, a Korean dietitian, is the first foreign recipient of a $2,500 Laura Kellar Scholarship of the Alpha Rho State (Oregon) chapter of Delta Kappa Gamma. Miss Parks is a graduate student this year at Oregon State College, Corvallis, where as part of her graduate study, she is preparing the first Korean-language book on dietetics. Miss Parks has earned both a bachelor's and master's degree from Ewha Women's University, Seoul, and has been teaching there in the Home Management House.

## Plentiful Foods MONTHLY LIST

The USDA has listed the following foods expected to be in plentiful supply during December:

*Protein foods*
Chickens—broilers and fryers
Peanuts and peanut products
Pork
*Other foods*
Almonds
Apples
Cranberries
Filberts
Onions
Raisins
Sweet potatoes
Vegetable fats and oils

Supplies of dried, canned, and frozen fruits will be larger this season than a year ago, according to USDA calculations. Output of California dried prunes is expected to be 150,000 tons—56 per cent heavier than in 1958. A much larger crop of raisin-variety grapes in California will also mean more raisins, although some are sold fresh and some are used for crushing. Increases are also expected in dried apricots, peaches, and pears.

A moderate increase in the size of packs for apricots, red sour cherries, peaches, pears, purple plums, and fruit cocktail is also likely, as well as a slight increase in the pack of frozen fruits and berries. More frozen red sour cherries are anticipated, due to a large crop of these favorite pie cherries in the Great Lakes states this year.

**Frozen Foods for December.** The National Association of Frozen Food Packers points out that frozen foods have special out-of-season appeal in the winter months and during the holiday season. Here are some special suggestions to feature during December, because the foods are generally available and economical at this time of year.

*Fruits and Juices*

CONCENTRATED ORANGE JUICE — the ascorbic acid content helps to protect against winter infections.

APPLES—add spices and lemon juice to bring out more flavor when using in applesauce, cobblers, pies, Betties and Johns.

RASPBERRIES—to add both color to your menu and tartness; also delicious as ice cream topping or on cereals at breakfast.

FROZEN MINCE PIES—to save labor during the holiday season.

*Vegetables*

ASPARAGUS, spears and cuts and tips—use the cuts and tips for asparagus soufflé, and the spears in chicken or turkey divan.

CORN, cut—corn soufflé can add extra appeal to your menus.

SPINACH—save 45 per cent waste over the fresh product, as well as labor time by using frozen spinach.

**New Benefits for AMSC Dietitians.** A new law recently signed by the President will benefit certain officers of the Army Medical Specialist Corps who were not previously eligible for Reserve Retired Pay. Types of service which will now be credited in computing Retired Pay are:

(a) Army service in temporary wartime appointments prior to July 10, 1944 and after June 30, 1948.

(b) Regular or Reserve service in the Army or Navy Nurse Corps as it existed at any time after February 2, 1901, when the Corps were first organized.

(c) Active full-time duty, except as a student or apprentice, performed with the "Army Medical Department" as a civilian dietitian between April 6, 1917 and April 1, 1943.

When many AMSC Reserve officers were relieved from active duty or from Active Reserve status, they requested transfer to the Retired Reserve because they could not acquire eligibility for Retired Pay prior to reaching age sixty. With the change in law, such Reserve officers may request transfer to an active "Ready Reserve" status, provided they can now acquire an eligibility for Reserve Retired Pay prior to age sixty.

The new law further benefits dietitians by providing that all service may be considered as commissioned service.

**Symposium on Infant Nutrition.** On October 27, a Symposium on Infant Nutrition, held at New York Hospital-Cornell Medical Center, New York City, was sponsored by the Council on Foods and Nutrition of the American Medical Association. The morning session was spent considering protein nutrition. Four papers on this subject were presented: "Amino Acid Requirements of Infants," by Dr. L. Emmett Holt, Jr., New York University; "Differences in Human and Cow's Milk," by Dr. Harold H. Williams, Cornell University; "Protein Allowances for Premature Infants" by Dr. Harry H. Gordon, Sinai Hospital, Baltimore; and "Protein Allowances for Full-Term Infants" by Dr. Calvin W. Woodruff, Vanderbilt University School of Medicine.

In the evening, the second session opened with a paper on appetite regulation in infants by Dr. John R. Brobeck, University of Pennsylvania. "Iron Requirements of the Infant" were discussed by Dr. Irving Schulman, Northwestern University. The symposium closed with a paper on "Clinical Manifestations of Genetic Aberrations of Calcium and Phosphorus Metabolism" by Dr. Donald Fraser, University of Toronto.

Emma Mike and Julia Trassbach of New York City attended the symposium as A.D.A. representatives.

**Symposium on Geriatric Nutrition.** "Newer Knowledge of Nutrition" was the subject of a symposium in Philadelphia on October 30, sponsored jointly by the American Geriatric Society and the Committee on Chronic Diseases, Philadelphia County Medical Society. The program included:

"Fifty Years of Nutrition Philosophy"—Elmer V. McCollum, Ph.D., Professor Emeritus, The Johns Hopkins University, Baltimore

"Newer Knowledge of Carbohydrate Metabolism" — Sidney Weinhouse, Ph.D., The Institute of Cancer Research and Temple University, Philadelphia

"Newer Knowledge of Protein Metabolism"—Jakob A. Stekol, D.Sc., The Institute for Cancer Research, Philadelphia

"Newer Knowledge of Lipid Metabolism"—Anthony Chung, Ph.D., The Lankenau Hospital, Philadelphia

"Nutrition in Chronic Illness"—Robert S. Goodhart, M.D., The National Vitamin Foundation, Inc., New York City

"Use and Abuse of Newer Knowledge about Food" — Clive M. McCay, Ph.D., Cornell University, Ithaca, New York

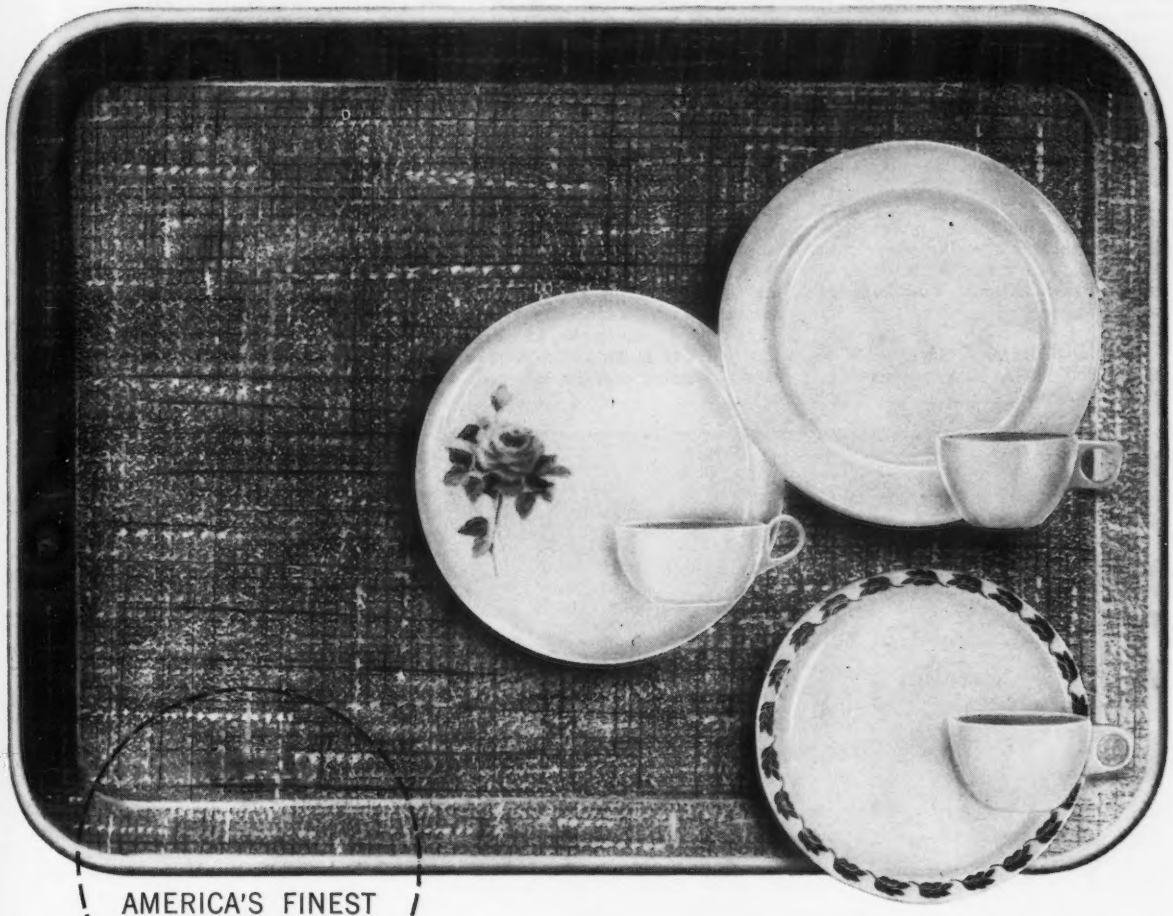
"Exercise and Nutrition"—Steven M. Horvath, Ph.D., The Lankenau Hospital, Philadelphia

"Institutional Food Planning" — Frances R. Godshall, Ed.D., Temple University, Philadelphia

"Weight Control in the Older Individual" — Thomas H. McGavack, M.D., VA Center, Martinsburg, West Virginia

"Nutritional Discoveries and How They Affect You and Me"—Elmer V. McCollum, Ph.D.

**Air Force Medical Specialist Corps.** Twenty-two Air Force dietitians attended the Annual Hospital Food Conference of the Air Force Medical Specialist Corps held in Washington, D.C., on October 29 and 30. Director of the conference was Grace L. Stumpf, Director of Dietetics, University of Michigan Hospitals. Capt. Jean T. Smith, Headquarters USAF,



AMERICA'S FINEST
MELAMINE
DINNERWARE

# ARROWHEAD®

## fills the order for **every** food service!

**Beautiful** patterns, colors and styles! Arrowhead meets all serving requirements, blends with any decor.

**Sanitary!** Safe in all mechanical dishwashers—bacteria can't cling to Arrowhead's hard, smooth surfaces.

**Non-breaking!** You save up to 80% in replacement costs.

**Lighter weight!** You save labor, save time, with larger tray loads.

**Quiet!** Cuts noisy clatter, makes a more dignified atmosphere for dining.

**Insulating!** Keeps hot foods hot, cold foods cold—no pre-heating needed.

**ARROWHEAD®**
Dept. JD-12, 4387 West 35th St., Cleveland 9, Ohio

Please send fully illustrated, full-line catalog. No obligation.

Name _____

Address _____

City _____ Zone _____ State _____

assisted. The topics discussed included: responsibilities of the dietitian, management, and new methods. Edith A. Jones, Clinical Center, National Institutes of Health, Bethesda, Maryland, was a guest speaker.

Five new appointments of dietitians to the USAF have recently been announced: Capt. Janet Reichle; Capt. Delpha Foster; Lt. Sally Johnson; Lt. Sally Hanak; and Eleanor Boozer. Three dietitians have returned to civilian status, following their marriages: Lt. Mary Lister Paissios, Lt. Valeta Brown Kuenzi, and Lt. Margaret Haugen Garret.

**Lamb and Mutton Grades to Be Revised.** The USDA has proposed revision of the federal standards for grades of lamb, yearling mutton, and mutton carcasses. Under the new proposals, quality requirements for very young lambs in both grades are reduced by about one-half grade; for more mature lambs, they are reduced in the Prime grade by about a full grade and in the Choice grade, by about two-thirds. Changes in quality requirements involve: (a) eliminating consideration of overflow fat, (b) less emphasis on maturity, and (c) changing the relative importance of and lowering the requirements for feathering between the ribs, fat streakings in the flanks, and firmness. For yearling mutton and mutton carcasses, similar changes are proposed.

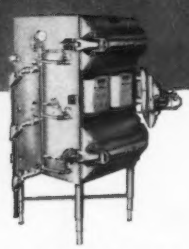
**Government Publications.** One-fourth of the consumer's food dollar on the average is being spent for food served away from home—in restaurants, cafeterias, hotels, schools, and so on, according to a new report from the USDA, titled *Policies and Practices of Some Leading Institutional Wholesale Grocers.* The share of food products entering into domestic civilian distribution which is marketed by food service establishments has increased from 13 per cent in 1938 to 17 per cent in 1948. This report shows that marketing costs are high—approximately 15.4 per cent of the cost of merchandise in 1958—and improvements in marketing practices offer possibilities for substantial savings. Research is going forward along many lines to achieve these savings, according to this report. Data are presented in six sections: physical handling operation, buying procedures and practices, sales policies and procedures, customer service policies and practices, accounting and control procedures, and the future of institutional wholesaling. Single copies of this publication, Marketing Research Report No. 335, may be requested from the USDA's Office of Information, Washington 25, D.C.

A second new release from the USDA is an illustrated folder, "How to Buy Poultry by USDA Grades" (Marketing Bulletin No. 1). In it are shown the official grade marks for poultry and the differences between the three grades—U.S. Grade A, B, and C. Tips on buying and using poultry are also included. Single copies of this folder also, will be sent on request by the USDA's Office of Information, Washington 25, D.C.

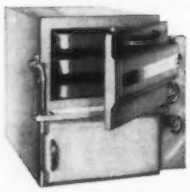
Another new USDA consumer booklet is "Pork in Your Meals" (PA-405), which deals with the nutritive value of pork and the cuts of cured and fresh pork in table and chart form. It also gives directions for cooking and storing pork, as well as recipes for combination main dishes. Again, single copies are available on request from the USDA's Office of Information, Washington 25, D.C.

**FAO Publication.** Newest of the reports to be released by the Food and Agriculture Organization is *Milk and Milk Products in Human Nutrition* by S. K. Kon (FAO Nutritional Studies No. 17). In it, the author brings together the current knowledge about the nutritive value of milk and milk products, describing methods of processing, uses in different parts of the world, and the measures now being taken to supply milk to those who need it. The booklet is intended for the practical use of international workers and their national "counterparts" associated with them, such as dairy experts, health specialists, nutritionists, home economists, and milk engineers. It should also be of value to a wider public and serve the purpose of spreading knowledge about milk and of contributing to its greater


Let STEAM-CHEF and Steamcraft
RECONSTITUTE YOUR
FROZEN FOODS...
Fast and Easily!



*3 compartment STEAM-CHEF — gas, electric or directly-connected to your steam supply.*



*Steamcraft is for smaller requirements, or for supplementing a STEAM-CHEF.*

*Steamer-Kettle combinations, in all types and sizes, are available. Ask for STEAM-THRIFT bulletin.*

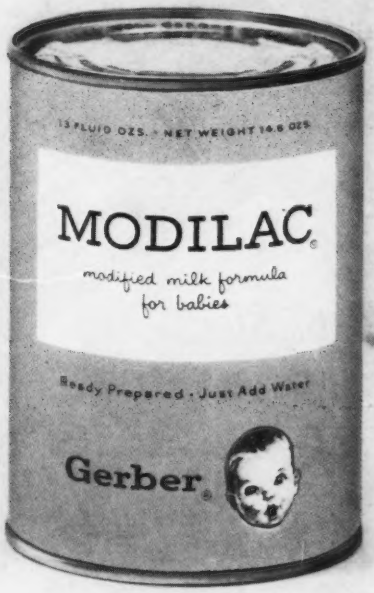
Let steam do this extra, important job for you in your kitchen. Steam is fastest because it goes right to work . . . *immediately.* It's easiest and safest because there's no chance of overheating. And, with many foods, it's not necessary to defrost before steaming. In fact, you conserve nutrients as well as time when you reconstitute frozen foods in a Cleveland Steamer.

Besides reconstituting frozen foods, a Steam-Chef or Steamcraft cooks many foods . . . fastest, easiest and at least cost. Steam-Chef cooking retains more nutrients, more color and more flavor than any other cooking method. Let us send you the complete story, as well as "What Users Tell Us." Write today!

**THE CLEVELAND RANGE CO.**
"HEADQUARTERS FOR STEAM-COOKERS"
971-L EAST 63 STREET • CLEVELAND 3, OHIO

# ANNOUNCING... MODILAC®

A COMPLETELY NEW, READY-PREPARED FORMULA WITH MILK-WHITE COLOR, TRUE MILK FLAVOR




**True milk color . . . true milk flavor . . .** excellent acceptability. Modilac is prepared by a modern procedure that retains the natural color and real flavor of milk. It is immediately acceptable to the newborn and enjoyed throughout infancy. Modilac makes the transition to fluid fresh milk easier, with no appetite loss.

**Nutritionally realistic.** Modilac is cow's milk, specifically adapted to the infant's digestive and nutritional requirements. Protein value of this new formula is intermediate between that of breast milk and cow's milk.

**Modified to meet infant needs.** The combined carbohydrates are absorbed throughout the digestive process, maintaining uniform blood sugar levels. Corn oil (which provides ample linoleic acid) replaces butterfat. For detailed nutritional analysis of Modilac, write Professional Services Department, Gerber Products Company, Fremont, Michigan.

BABIES ARE OUR BUSINESS...OUR ONLY BUSINESS!

**GERBER® BABY FOODS**

utilization in preventing malnutrition and promoting health.

Chapters deal with the composition and nutritive value of different kinds of milk, treated liquid milk and milk products, the place of milk and milk products in national diets, and their use in child feeding schemes. Copies may be purchased in the U.S. from International Documents Service, Columbia University Press, 2960 Broadway, New York 27, for 75 cents each.

**British Report.** Data on *Domestic Food Consumption and Expenditure: 1957* in Great Britain are now available In this annual report of the National Food Survey Committee are described the diets of households of different income grades and different family composition. In one section the diets of families with younger and older children are compared and the indications are, on the whole, that the nutritional position of the former is more satisfactory. Special attention is paid to changes in the composition of bread, following the introduction of the Flour Regulations. A new section of the report is concerned with dietary differences associated with occupational status and skill and has been included to meet the needs of research workers in social medicine, since census and mortality data have long been analyzed in this way. Copies of this report may be ordered from Her Majesty's Stationery Office, London, for 8s. 6d. each.

**Interns' Graduation.** On August 19, certificates and A.D.A. pins were presented to fifteen dietetic interns at the University of Michigan Medical Center by A. C. Kerlikowski, M.D., Director. The graduates are:

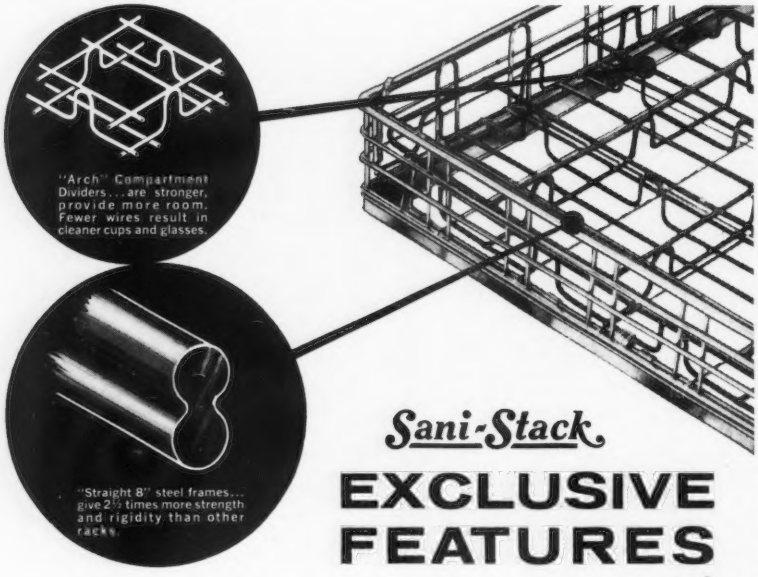
Cynthia Lee Anderson, Michigan State University
Helen Lester Anderson, University of Kentucky
Lois Jean Brunner, Colorado State University
Sally Ann Coltrin, Pennsylvania State University
Antionette M. DeCamilo, University of Connecticut
Judith Virginia Hage, University of Illinois
Gwendolyn M. Hinton, Miami University
Carolyn Marie Hopperstad, Iowa State University
Mary H. Hoxie, Iowa State University
Sevie E. Johnson, University of North Dakota
Joan Mary Lawler, Framingham (Massachusetts) State Teachers College
Doris Keiko Nobumoto, University of Hawaii
Mary A. Regan, St. Joseph's College
Barbara G. Slay, Hunter College
Mary Jane Slusher, University of Missouri

**Radioactivity of Vegetables within Safe Limits.** In October the Food and Drug Administration released its second report on the radioactivity in fresh vegetables. During the latter half of 1958, 402 samples were collected· this year, 139 have been examined. Products have included: cabbage, cauliflower, celery, beans, broccoli, Brussels sprouts, collards, beet tops, lettuce, kale, mustard greens, parsley, potatoes, tomatoes, peppers, spinach, turnip greens, and water cress. The radioactivity has been found to be well within the safe limits recommended by the National Committee on Radiation Protection and Measurements.

The highest average total beta radioactivity thus far found was 6700 micromicrocuries per kilogram for spinach. The average for all vegetables from all sources was 2520 micromicrocuries per kilogram, with the highest single value being 56,000, obtained on a sample of spinach from Illinois.

In addition to total beta radioactivity, samples of certain staple foods are being continuously examined for strontium-90. Thus far, it has ranged from 0.5 micromicrocurie per kilogram for potatoes from California to 16.8 for lettuce, also grown in California. Other states covered in the strontium-90 analysis so far completed include: Maryland, Kansas, Ohio, Texas, Minnesota, and Illinois. It is not yet known whether some vegetables have a greater affinity for strontium-90 than

(*Continued on page* 1327)



"Arch" Compartment Dividers... are stronger, provide more room. Fewer wires result in cleaner cups and glasses.
"Straight 8" steel frames... give 2½ times more strength and rigidity than other racks.

Sani-Stack

EXCLUSIVE FEATURES

mean EXTRA VALUE for you!

You get 2½ times more strength with Sani-Stack racks. Tests prove it. You get extra features...extra value at no extra cost. Every Sani-Stack feature has been proved and improved by Metro, the pioneer in the "rack and stack" system.

**Sani-Stack is better!**
Metro has specialized in wire fabricating for 30 years. We form—weld—chrome plate—plastisol coat—assemble in our own plant! Sani-Stack means undivided responsibility—top quality from start to finish.

**Metro serves you better!**
Metro maintains the largest inventory of racks and related products of its kind. Consequently, you get immediate delivery of the rack designed for your equipment —not a substitute.

**Insist on genuine Sani-Stack Racks**
Only Metro makes Sani-Stack—the finest rack, competitively priced, prompt delivery! Insist on genuine Sani-Stack—accept no substitutes!

Sani-Stack
*a quality product of*
METROPOLITAN WIRE GOODS CORP.
N. Washington St. & George Ave., Wilkes-Barre, Pa.

(*Continued from* 1314)

others, and larger numbers of determinations will be needed before the above results are fully representative.

The maximum permissible level in the diet over an entire lifetime is currently set at 80 micromicrocuries strontium-90 per liter of liquid or kilogram solid food. These levels may be exceeded by varying amounts for varying periods without causing appreciable harm to the individual. An additional safety factor, the FDA points out, is provided by washing, prior to cooking or eating vegetables.

Tabular data on the average total beta radioactivity of the different vegetables examined and of the strontium-90 content of vegetables by states are available from the FDA.

The data on beta radioactivity, however, are without significance at present, because they cannot be related to any standard, such as the 80 micromicrocurie-level being used as a strontium-90 standard.

Strontium-90 content of the nation's major water courses during the second quarter of 1959 were also very substantially below the levels considered permissible, according to a separate report issued in October by the U.S. Public Health Service. Weekly samples from fifty-one stations, including seventeen major rivers, are being examined in a continuing study of stream pollution. Strontium-90 ranged from 0.1 micromicrocuries per liter of water taken from the Great Lakes at Duluth to 4.8 microcuries per liter for water from the Tennessee River at Chattanooga.

**Cooking with Hard Water.** Frozen green beans and frozen peas have been cooked at the South Dakota Experiment Station in: (a) distilled (mineral-free) water, (b) natural waters of the area varying in mineral content and hardness from 4 to more than 80 grains, and (c) in natural waters after softening. A panel of judges rated the cooked products for color, flavor, and tenderness.

Regardless of cooking time, vegetables cooked in softened water were more tender than those cooked in the natural hard water. The best ratings for tenderness went to peas cooked in softened water 5 to 10 min. and to green beans cooked from 5 to 15 min. The flavor and color of both peas and beans rated about the same, irrespective of the softness or hardness of the water. Peas boiled 5 min. rated best in flavor, although those cooked 10 to 15 min. also rated high. Longer cooking time in softened water made the vegetables too soft.

Coffee and tea were also tested, using the same types of water, and judges rated as best the flavor of beverages made with hard water. The experimenters comment, however, that the judges were accustomed to hard water in these beverages. On the other hand, tea was clearer and better in color if steeped in distilled or softened water. The Station recommends that, when hard water is used, it be boiled 7 to 10 min. before steeping, which will make a clearer beverage.

**Use of Nonfat Dry Milk.** Greatly increased use of nonfat dry milk in the last ten years is reported by the USDA. In 1948, only 2 million lb. were packaged for household use, but by 1958, this total had risen to 170 million lb. A recent survey by the Agricultural Marketing Service of nearly 500 families in the metropolitan Chicago area showed that 46 per cent bought nonfat dry milk in one or more of six semi-annual survey periods; 10 per cent were frequent purchasers, having bought the product at least once in each period. Generally, purchases were inversely related to family income; the lower the income, the more nonfat dry milk was used. Purchase rates for fresh milk, on the other hand, were greater for middle- and high-income families, each class purchasing about the same amount.

Practically all of the families in the sample bought fresh fluid milk during the six-month survey period, and almost one-sixth purchased nonfat dry milk. Half bought evaporated milk.

**Removal of Strontium-90 from Milk to Be Studied.** A joint research effort to develop dairy-plant methods of removing strontium-90 from milk is

J&J
NEW GREX
DISH BOXES
HIGH DENSITY POLYETHYLENE
Resists Detergents— Odor Resistant
Tough Stain Resistant Rigid
Net Selling Price $5.50 ea.
Colorful, lightweight, inexpensive
VIRTUALLY INDESTRUCTIBLE
Now available with all J & J dish trucks, including the new "Assemble and Save" units. Lightweight, easy-to-handle, inexpensive . . . the cost-saving replacement for heavy, stainless steel boxes.
Many other uses: for food processing and handling, to hold chemicals or detergents, wherever extremes of temperature are encountered, or where the container is subjected to unusually rough treatment.
To anticipate these varied uses, Jarvis is offering the boxes as a completely separate line, now available at your dealer's.
Mold design permits secure cross stacking.
Convenient nesting without binding.
Wide roll-over edges for easy lifting.
APPROVED BY NATIONAL SANITATION FOUNDATION
Sold Through Quality Dealers
Jarvis AND Jarvis, Inc.
PALMER, MASSACHUSETTS
In Canada: Jarvis & Jarvis of Canada, 1744 William St., Montreal, Quebec

being planned by the USDA, the Atomic Energy Commission, and the U.S. Public Health Service. It has already been shown that, on a laboratory scale, this is possible through the use of ion-exchange resins. Although levels of radioactive fallout from past nuclear tests do not now justify action to decontaminate milk supplies, the research is designed to provide practical answers to problems that might arise in the future.

Strontium-90 is absorbed by plants through their leaves, which are, in turn, ingested by cows and other ruminants. The best evidence is that the animals take into their systems about 5 per cent of the strontium-90 ingested and that a dairy cow secretes in her milk about 1 per cent of the strontium-90 consumed each day. More than 90 per cent and possibly more than 95 per cent of the strontium-90 in such milk, according to laboratory tests, can be removed by ion-exchange resins.

**Cold Water Washing of Glasses to Be Tested.** At the University of Michigan School of Public Health, Edward Armbruster, a public health engineer, has developed in the laboratory a cold-water process of washing drinking glasses which requires only 4 seconds to remove all surface dirt and invisible grease film. The process uses only fresh cold water and a detergent-sanitizer fluid. The washer contains revolving brushes to provide the necessary brisk mechanical action to remove dirt, film, and germs. All water flows immediately out of the washer so that there is no reservoir of contamination.

Public health specialists have found that conventional sinks often become reservoirs of filth and bacteria after extensive washing, and that an invisible grease film clings to all glasses "cleaned" by the short-cut methods often used in public eating places and in homes. While the grease film is harmless in itself, the danger lies in its proved ability to shield bacteria through repeated washings.

The cold-water washing method, the first to be developed in a laboratory, will be tested at a drugstore lunch counter and a veterans' club bar in Ann Arbor to confirm the machine's ability to disinfect itself over long periods of continued use.

**Correction.** We beg your pardon. A typographical error escaped the eagle eyes of five different proofreaders of the November issue of the JOURNAL. On page 1170, in Table 1, "Calcium and phosphorus in edible portions of twenty-two foods," the data for calcium are actually in terms of "mg./100 gm."


HANDBOOK OF DIET THERAPY

3rd edition by Dorothea F. Turner

DEVELOPED FOR THE AMERICAN DIETETIC ASSOCIATION

- Descriptions of therapeutic diets
- Menu plans
- New tables on food composition
- Revised glossary of dietetic terms

The handbook includes new chapters on diet during pregnancy, adolescence, and old age; on energy expenditure; on fatty acid modifications; and on phenylalanine restrictions.

A 208-PAGE AID TO:

DOCTORS
NURSES
DIETITIANS
NUTRITIONISTS
MEDICAL STUDENTS
HOME ECONOMISTS

ORDER FROM
THE AMERICAN DIETETIC ASSOCIATION
620 NORTH MICHIGAN AVENUE
CHICAGO 11, ILLINOIS
PRICE: $5.00


## News of State Associations

**Arkansas Dietetic Association.** November 3 was the date of the fall meeting of the Arkansas Dietetic Association in Little Rock. Isabel Irwin, Ph.D., Associate Professor of Home Economics, University of Arkansas, Fayetteville, was the featured speaker. Her topic was "Current Research in Nutrition at the University of Arkansas." The A.M.A. film, "The Medicine Man," was shown, and a report of the A.D.A. meeting in Los Angeles was made by Geraldine Getty, Delegate.

**Colorado Dietetic Association.** A fall meeting of the Colorado Dietetic Association was held in Pueblo on October 10. The program included:

"Relationship of Diet to Drug and Psychotherapy in Hypertension"—Dr. Wesley Van Camp, Colorado State Hospital, Pueblo

"Management Techniques" — Sister Ancilla Domenici, St. Mary Corwin Hospital, Pueblo

"Safety in the Dietary Department"—A. H. Zeilinger, Chairman, Colorado Industrial Commission

**Florida Dietetic Association.** Palm Beach was the scene of the fall meeting of the Florida Dietetic Association on October 8 and 9. The program was planned around a theme of "Recent Developments" and included:

"Recent Developments in Nutrition"—Faye W. Grant, Ph.D., Department of Home Economics, University of Miami, Coral Gables

# HAVE YOU EVER TRIED PRIMEX?

Until you do, you'll never know why

thousands of successful restaurants

keep using it year after year to get

SUPERIOR RESULTS in DEEP FRYING,

PAN FRYING...in baking PIE CRUST,

PASTRIES, COOKIES and ROLLS, too!

*PURE, ALL-VEGETABLE*

PRIMEX ...for over 25 years, America's greatest all-purpose shortening

PROCTER & GAMBLE

...leader in quality products and service to the food industry. Makers of

PRIMEX • SWEETEX • PERTEX • SELEX • FRYMAX • GLODO • PURITAN OIL

"Recent Research in Economics of Convenience Foods"—J. L. Newcomber, Food Service Industry Research Service, Michigan State University, East Lansing

"Recent Developments in Administration" — Charles Rovetta, Dean, School of Business, Florida State University, Tallahassee

"Recent Developments in Food Research"—Betty Watts, Ph.D., Florida State University

**Maryland Dietetic Association.** On October 28, the Maryland Dietetic Association participated in the 20th Annual Tri-State Hospital Conference in Washington, D.C. The program included:

"Major Problems of Nutrition in the World"—Moses Behar, M.D., Institute of Nutrition of Central America and Panama, Guatemala City

"Medicine at Home, Abroad and in Space"—James P. Isaacs, M.D., The Johns Hopkins Hospital, Baltimore

"The Race Between Population and Food Production: Can the World Be Better Fed?"—Jean W. McNaughton, Regional Nutrition Officer, North American Regional Office of FAO, Washington, D.C.

Civil defense was the subject of the November 2 meeting, held at St. Joseph's Hospital, Baltimore. John M. Welch, M.D., (Col., U.S.A. Ret.), Medical Officer, State Civil Defense Office, spoke on "Civil Defense and General Food Problems."

**New York State Dietetic Association.** The *Greater New York Dietetic Association* sponsored a meeting on "Equipment" at the National Hotel Show on November 2. The guest speaker was A. C. Avery, Technical Director, Commissary Research Division, U.S. Naval Supply Research and Development Facility, Bayonne, New Jersey.

**Oregon Dietetic Association.** October 30 and 31 were the dates of the fall meeting of the Oregon Dietetic Association in Portland. The program included:

"Oregon Plans for the 1960 White House Conference on Children and Youth" — Mrs. William Kletzer, Chairman, Governor's Committee on Children and Youth

"What Are Our Responsibilities for Professional Growth?" — a panel discussion

"Functional Bowel Distress" — Dr. George A. Boylston, Portland

**Washington State Dietetic Association.** The fall meeting of the Washington State Dietetic Association was held in Olympia on October 16 and 17. The program featured:

"The Dietitian as a Therapist in the Psychiatric Program"—Dr. William Conte, Director of Mental Health, Washington State Department of Institutions

"The Medical Care Program in the State of Washington"—Dr. George Spendlove, Washington State Department of Public Assistance

"The Role of the Low-Fat Diet in the Treatment of Multiple Sclerosis"—Dr. Roy Swank, University of Oregon Medical School, Portland

"The Challenge in Food Service Administration"—a panel discussion

LeVelle Wood attended this meeting as A.D.A. representative and spoke on "Association Highlights."

Washington state dietitians are cooperating this fall with the Washington State Heart Association in presenting a series of classes on the low-sodium diet in three cities—Bremerton, Port Angeles, and Vancouver.

The first fall meeting of the *Seattle Dietetic Association* in September was devoted to a panel discussion on "Combating Food Misinformation" led by June Stein. In October, Dr. Arnold L. Flick, University of Washington Medical School, spoke to the group on the gluten-free diet.

## *Association Activities*

**Myrtle Van Horne Appointed Kellogg Project Director.** On October 19, Myrtle Van Horne joined the A.D.A. staff as Project Director for the experimental training program for hospital food service supervisors which will be carried on for the next eighteen


FOR THOSE WHO WANT THE BEST
COOKING WARE
BY LEGION

*Wherever cooking is an art . . . skilled chefs insist on utensils that are good heat conductors that guard against corrosion and are easy to clean.*

**BI-METAL....** for the finest kitchens. A Scavullo patented process which prevents bulging, blistering or separating. Bi-Metal is 18-8 seamless drawn stainless steel inside with heavy gauge copper outside.

18-8 Stainless Steel
COPPER

**TRI-PLY.....** for extra strong, heavy duty. Tri-Ply by Legion are utensils consisting of double plys of 20% stainless steel over a core of 60% mild steel. This is the material specified by the Army Medical Corps, U.S. Navy and Veterans Administration. Ideal cooking utensils for hospitals and institutions.

20% 18-8 STAINLESS
60% MILD STEEL
20% 18-8 STAINLESS

**FOUR-PLY...** all Tri-Ply utensils are available with added copper bottoms. This fourth ply assures quicker, even distribution of heat over the cooking surface.

20% 18-8 STAINLESS
60% MILD STEEL
20% 18-8 STAINLESS
COPPER

*For the finest in cooking ware—serving ware—buffet ware in copper, and stainless steel, specify LEGION.*

LEGION UTENSILS CO., INC.
21-07 40TH AVENUE, LONG ISLAND CITY 1, N. Y.
*Representatives:* SAN FRANCISCO BEVERLY HILLS MIAMI BEACH

# 2,000 hot, nutritious meals each school day

## ...thanks to GAS

Kitchen of Morrell High School showing modern Gas-fired equipment.

Just one look at the efficient cafeteria operation of Morrell High School, Irvington, New Jersey proves Gas is best for performance, cleanliness, speed and economy. More than 2,000 hot, tasty meals are turned out every day in a streamlined operation using Gas-fired cooking equipment. Gas is preferred and used in all food service operations, from deep frying to baking and cooking. The modern Gas equipment includes 3 ranges, 2 fryers, a broiler and an Add-A-Unit, all by Magic Chef, as well as a Blodgett oven, a Groen stock pot, and a Cleveland Steam Chef vegetable cooker. A Blakeslee dish-washing machine and Plibrico incinerator complete Morrell's list of Gas-fired equipment.

For information on how you can benefit by using Gas and installing modern Gas equipment, call your Gas Company's commercial specialist. He'll be glad to discuss with you the economies and outstanding results you get with Gas and modern Gas equipment. *American Gas Association, 420 Lexington Avenue, New York 17, New York.*

*Another "First" by* **CELLU**

**NEW Liquid Saltrol**

*adds the tang of salt...plus true food flavor*

At last! A *liquid* salt substitute that's double-acting: adds the snap and zest of salt . . . and *boosts* the true flavor of all foods. Jaded appetites perk up . . . foods taste better . . . menus take on new life. And Liquid Saltrol is easily dispensed and measured — no grains and guesswork! Highly stable, Liquid Saltrol is perfect for table use, baking, cooking and canning. Chief ingredients are Potassium Chloride and Ammonium Chloride. Sodium content averages 3 mgs. in 100 grams or less than 1 mg. per oz. Packed 12 — 4 oz. bottles per case.

CELLU Dietetic Foods are the finest of their kind. Over 300 items available.

*Send for your copy of CELLU'S complete catalog of low sodium items.*

**CHICAGO DIETETIC SUPPLY HOUSE, INC.**

*1750 W. Van Buren, Chicago 12, Illinois*

**PREFERS CRAMORES**

*Manager of private institution, Kentucky:* "A truly fine quality product. We've used it for years in baking and cooking as well as drinks."

**CRAMORES CRYSTALS**

**LEMON - ORANGE - LIME**

- Ideal for institutional use
- Consistent, year 'round quality fruit flavor
- Economical—no spoilage—no squeezing
- Convenient—always available
- Requires no refrigeration

**CRAMORES "DRI-SYRUP"**

- Instantly soluble in cold water
- 2½ lb. bag makes 3 gallons of finished beverage
- Fortified with Vitamin C
- Lemon, pink lemon, orange and grape flavors.

**Now Available! Cramores Instant Hot Chocolate Powder • fortified with Vitamin D2.**

Cramore Products, Inc.

Point Pleasant Beach, N.J.

**EATING IS FUN— for Older People, Too**

***Designed to Aid Proprietors of Small Nursing Homes and Residences. Also Adaptable to Home Kitchens***

This attractive booklet is a guide to better food and food service in the small institution. Based on normal nutritional requirements for adults, the menu patterns, sample suppers, and pointers on meal planning have their place in any household. Practical ideas for making the work of the manager easier and pleasanter include a weekly marketing guide, hints for economy in buying and storage, and suggestions for serving.

This is a project of the Diet Therapy Section of The American Dietetic Association.

*Single copy 50¢*

Five copies ..... $2.00

Ten copies ..... 3.75

**Order from:**

**THE AMERICAN DIETETIC ASSOCIATION**

**620 North Michigan Avenue**

**Chicago 11, Illinois**

months under a special grant to the Association from the W. K. Kellogg Foundation. The objective of the program will be to determine the most expeditious method of making in-service training available for food service supervisory personnel in hospitals.

Initially, the experimental program will encompass the development of an extension-correspondence course with a limited number of students. At periodic intervals, the students will be brought together for laboratory sessions and evaluation. An alternative may be the bringing of another class to a study center for concentrated class and laboratory experience of four to six weeks. The grant was announced in Los Angeles in August at the meeting of the A.D.A. House of Delegates. Further details of the objectives and methods of approach to be used appeared in the October issue of the JOURNAL.

Miss Van Horne's experience qualifies her well for such a program. Since 1948, she has been Consultant Dietitian for the Michigan Department of Health, Lansing. In this position, she has been particularly concerned with food service problems facing small hospitals and institutions, and only recently published a small book, *Your Food Service*, which is a guide for food service managers. She served on the joint committee of the Michigan Hospital and Dietetic Associations which arranged for the special program of training for hospital food service supervisors now given at Michigan State University, also under a Kellogg Foundation grant. Her other duties have included reviewing and approving of kitchen facilities in Michigan hospitals built with Hill-Burton funds and consultative work with Michigan hospital administrators, dietitians, nurses, and food service managers.

Before joining the staff of the Michigan Department of Health, she acted for five years as dietitian consultant for a physician in private practice. For nine years prior to that work, she was Director of Dietetics, Woman's Medical College Hospital, East Falls, Pennsylvania.

Miss Van Horne holds both a bachelor's and master's degree from Michigan State University. Her dietetic internship was taken at Woman's Medical College Hospital. After graduation from college, but prior to her internship, she served as nutritionist with the Detroit Dairy Council and as Home Demonstration Agent, Cooperative Extension Service, Michigan State University.

**A.D.A. Representative to State Meeting.** Maj. Katharine E. Manchester was the A.D.A. representative at the Mississippi Dietetic Association meeting in Jackson, October 9 and 10.

**National Health Council.** The Second Conference on Recruitment sponsored by the Commission on Health

# CONTROL YOUR FOOD COSTS...

BOSTON BEAN POT

## SERVE UNIFORM PORTIONS *in*

HALL
*Secret Process*
FIREPROOF CHINA
AVAILABLE IN 26 BEAUTIFUL COLORS

**Hall Bean Pots,** and other Hall baking dishes, eliminate dependence upon the eye and hand of the server for portion control. The capacity of the dish guarantees uniform servings. Hall China also provides the advantage of showmanship—individual service—at its best. Write for Bulletin SM-1.

**THE HALL CHINA COMPANY • EAST LIVERPOOL, OHIO**
*The World's Largest Manufacturer of Fireproof Cooking China*

BAKING SHELL
INDIVIDUAL CASSEROLETTE
NEW ENGLAND BEAN POT
CHILI BOWL
CRAB SHELL

Careers of the National Health Council met on October 1 and 2 in New York City. Grace E. McMahon, VA Hospital, Bronx, attended as our representative, and Thelma Pollen, A.D.A. Headquarters office, was present in an ex-officio capacity.

The Conference brought together seventy-five representatives from fifty national agencies and professional societies for the purpose of exchanging experiences and exploring new recruiting programs and techniques. "Work experience"—paid or voluntary—was examined in depth as a valuable aid in career choice. The problems and needs of the guidance counselor and how health leaders can make more effective use of guidance counseling in promoting health careers were highlighted.

Dr. Alvin C. Eurich, Chairman of the Commission on Health Careers, emphasized the importance of developing still further the use of supportive personnel to conserve the time and energy of the professional person.

Speaking at the luncheon session, Dr. John D. Porterfield, Deputy Surgeon General, U.S. Public Health Service, challenged health leaders to be more creative in tapping the large reservoir of talent and brains among the youth of our nation. "Only about 35 per cent of our college-qualified youngsters ever complete college . . . Males still comprise about two-thirds of the students in our colleges and universities. Here are sizable young populations with a substantial prevalence of mental capacity which have probably been exposed very lightly if at all to a career case-finding program."

**National Women's Conference on Civil Defense.** Dorothy Bovee represented our President, Doris Johnson, Ph.D., at the National Women's Conference on Civil Defense in Washington, D.C., September 28 and 29. Her report follows:

"This conference had as a theme 'Civil Defense—A Living Symbol of Freedom.' Over two hundred representatives of many national women's organizations, associations, and clubs attended.

"In the main, the conference was concerned with (a) the continuity of the government program, (b) the shelter program, and (c) the home preparedness program. Throughout the conference, emphasis was on action—what each of us and our organizations can do to make civil defense effective.

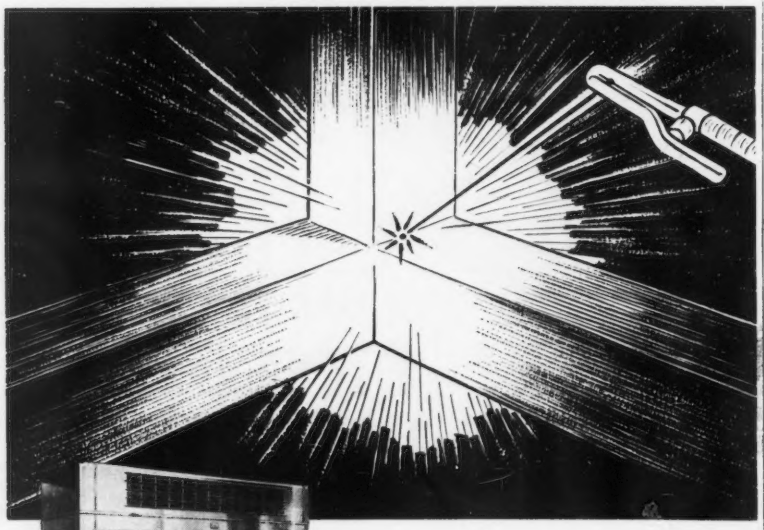
"The Home Preparedness Award program was introduced. One section of the conference was devoted to an explanation of this program and to discussions of ways to implement it so that the information may quickly reach every home in America. Briefly, the award program is designed especially for use by women's organizations. It is an incentive program to recognize our actual participation in home preparedness. A kit is provided to the local and state civil defense chairmen of an association. The material it contains may then be presented by her to the membership at meetings. The reference pamphlets are made available for membership distribution on request from the local civil defense director or from the state or the regional office of Civil and Defense Mobilization.

"Emergency feeding was not particularly emphasized, although it was mentioned by several speakers. One report described a demonstration program in a Nebraska college where civil defense is being integrated into the total college curriculum. Mention was made of the integration of content material on emergency mass feeding and home preparedness into the curriculum of the home economics department.

"Another report was by a young homemaker, who, with her husband and three children, lived in a prototype shelter for two weeks to pilot-test the experience as part of a research project conducted by Princeton University. Many of the questions from the audience concerned the family food supply and the problems of preparing and serving meals."

Vera Tharp, Chairman of A.D.A. Disaster Feeding and Civil Defense Planning Committee, also attended this conference.

**Other Meetings.** Dagmar T. Walch,



**New Herrick welded steel frame strongest ever built!**

Rugged 1" square-tube steel gives exceptionally solid, sturdy structure. Enables Herrick refrigerators to deliver longer, more trouble-free service under most adverse kitchen conditions. Precision welded in compressed-air jigs for perfect alignment. Securely reinforced. Cannot warp, buckle or spring out of shape. Undercoating on inside of cabinet shell acts as effective vapor barrier. Adjustable interior multiplies usefulness. Chrome-plated edge-mounted hardware lasts indefinitely. Investigate the new Herrick today!

HERRICK
STAINLESS STEEL REFRIGERATORS

ASK ABOUT HERRICK'S COMPLETE LINE

*Now more than ever . . . The ARISTOCRAT of REFRIGERATORS*

WRITE DEPT. DJ FOR NAME OF NEAREST HERRICK SUPPLIER

HERRICK REFRIGERATOR CO. WATERLOO, IOWA

# remember tenderly your grandmother...

# BUT NOT HER BREAD

## ...today's enriched loaf is better

Ask people what kind of bread they want. You can probably sum up a thousand answers this way: "Please make a good, old-fashioned loaf . . . the kind my grandmother (or mother) used to bake."

You remember how good that bread tasted, sliced warm and fragrant, fresh from the oven. You remember the family ritual of bread, and the wonderful aromas of dough proofing and loaves baking.

But have you forgotten the time and hard work, the sometimes misshapen loaves, the outright failures? Have you forgotten the troubles with the oven of the coal stove or wood range?

Whatever your own memory, you can be pretty sure grandmother's favorite bread was white. Whether you speak of grandmother's flour, George Washington's flour, Caesar's flour, or the flour of Egypt—you are still talking about white flour.

The finer and whiter the flour—the better, according to the time immemorial standard. Whether ground between stones, in a mortar and pestle, or produced in a modern mill—flour since the days of the Pharaohs has been bolted and sifted—to remove the bran, to produce fine white flour.

Although still white, today's flour, however, is different. Grandmother's flour varied from year to year, from place to place. But modern flours are ground from special varieties of wheat, many of them unknown a decade ago. They are milled into flours blended for baking quality—built to specifications for bakery or home use. With the flour of today, grandmother would have a better chance to bake better bread most of the time.

Finally, an even more important difference: Today's flour is nutritionally improved . . . enriched by the addition of B-vitamins, thiamine, niacin and riboflavin, plus food iron. To this enriched flour, today's bread-maker adds quantities of other good foods—milk, shortening, and sometimes egg—to make a loaf good far beyond grandmother's dream of good nutrition.

If you still hanker for grandmother's bread, cherish the memory. But also please remember that today's bread is a more wholesome loaf—processed with greater technical skill, baked to higher standards of constant perfection . . . and it's better bread, nutritionally, than anything grandmother ever knew.

***ENRICHED . . .***

and whole wheat flour foods are listed among the "Essential Four" food groups set up by the U. S. Dept. of Agriculture's Institute of Home Economics. Diet selected from these foods provides ample protein, vitamins and minerals.

**FREE-BASIC REFERENCE MATERIAL**
**USE COUPON OR SEND Rx BLANK**

To: Wheat Flour Institute Dept. ADCA-12
309 W. Jackson Blvd., Chicago 6, Ill.

To contribute to my understanding of the nutritional, economic and cultural values of wheat flour foods, please send me, at no cost or obligation, your two publications: *From Wheat to Flour* and the *Role of Wheat and Wheat Products in Human Nutrition.* (Please print)

NAME _____

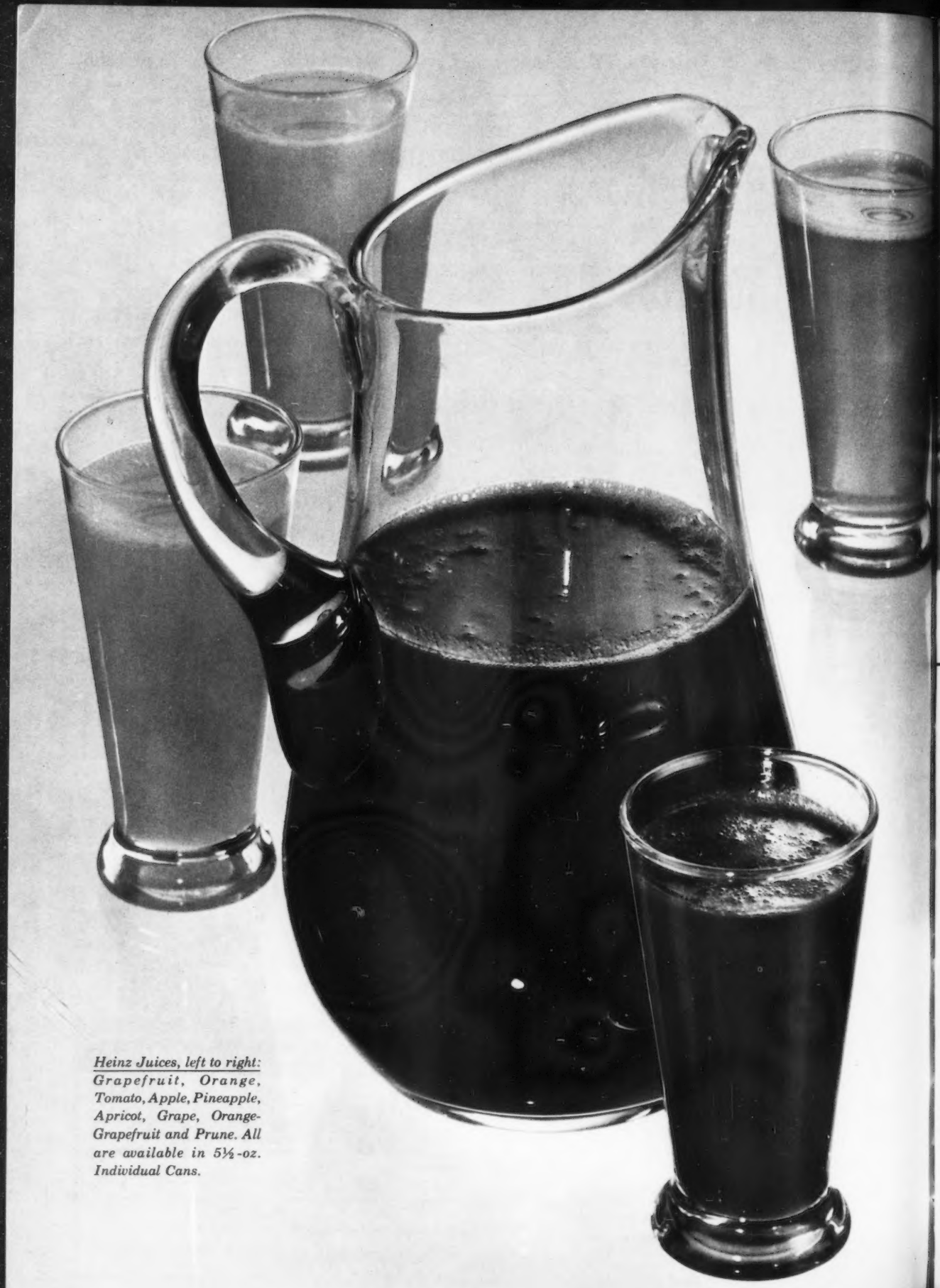
ADDRESS _____

CITY _____ ZONE _____ STATE _____

(Offer limited to United States and Possessions)

**WHEAT FLOUR INSTITUTE**

working for a healthier America through nutrition



*Heinz Juices, left to right: Grapefruit, Orange, Tomato, Apple, Pineapple, Apricot, Grape, Orange-Grapefruit and Prune. All are available in 5½-oz. Individual Cans.*

*Flavor is why*

# 8 times as many eating places serve Heinz Juices as any other brand

**You expect such a famous brand as Heinz to be the leader—and it is! An independent survey shows Heinz Juices are served in 8 times as many eating places. Be sure they're on your menu.**

**There are nine Heinz Juices,** you know—and Tomato is the most popular. This nationally distributed brand is made from vine-ripened California-grown tomatoes. Like *all* Heinz Juices, it has a rich natural taste, because it's packed at flavor peak. And it's made to rigid quality control, so you can serve it with confidence.

**Heinz Juices** in the 5½-oz. Individual Cans help eliminate waste through faucet loss, spillage and stale leftovers. Order Heinz Juices when your Heinz man calls. They're *all* good.

● All Heinz Juices come in 5½-ounce Individual Cans. Heinz Tomato Juice is also available in No. 10 cans and 46-ounce cans.

Wauwatosa, Wisconsin, and A.D.A. Public Relations Chairman, represented the Association at the *Sixth Annual Region 4 Women's Conference on Civil Defense,* November 12 and 13, in Milwaukee. Vera Tharp also attended.

Mary T. McInerney, New York State Department of Health, Albany, attended the annual meeting of the *Policy Committee of the National Citizens Committee for the World Health Organization* in Atlantic City on October 22 during the American Public Health Association meeting.

A meeting on Manpower Shortages in the Field of Health, sponsored by the *National Health Council* was held on October 22, in Atlantic City, during the American Public Health Association Meeting. Ruth Brennan, St. Louis County Health Department, St. Louis, served as our representative.

Evelyn Carpenter, A.D.A. Treasurer, and Director of Dietetics, Philadelphia General Hospital, represented our Association at the *Fifth Worldwide Air Force Food Conference,* in York, Pennsylvania, October 20 to 22.

The 1959 national educational conference on the *Federal Food, Drug, and Cosmetic Act,* was held in Washington, D.C., on November 16 and 17. This meeting was jointly sponsored by the Food and Drug Administration and the Food Law Institute for the purpose of discussing the important problems created by the food additives amendment and other major food problems under the Act, in order to promote a better understanding and a solution of these problems. Merme Bonnell, National Institutes of Health, Bethesda, Maryland, represented us.

**Regional Conference on Aging.** A Regional Conference on Aging was held in Minneapolis, on October 14 and 15. The Committee on Aging of the American Medical Association's Council on Medical Service, and the state medical societies of Iowa, Minnesota, North Dakota, South Dakota, and Wisconsin sponsored the conference. Ruth Stief and Eileen Reardon from the Minnesota Department of Health, Minneapolis, and other dietitians from the area attended this meeting. Miss Reardon reports:

"The Council on Medical Services Committee on Aging developed a six-point program referred to as the 'blueprint' that provides a basis for action by medicine in the field of aging. This was explained by Gunnar Gunderson, M.D., LaCrosse, Wisconsin, and Past President, American Medical Association. The six points are:

(a) Stimulation of a realistic attitude toward aging by all people.

(b) Promotion of health maintenance programs and wider use of restorative and rehabilitative services.

(c) Extension of effective methods of financing health care for the aged.

(d) Expansion of skilled-personnel training programs and improvement of medical and related facilities for older people.

(e) Amplification of medical and social-economic research in problems of the aging.

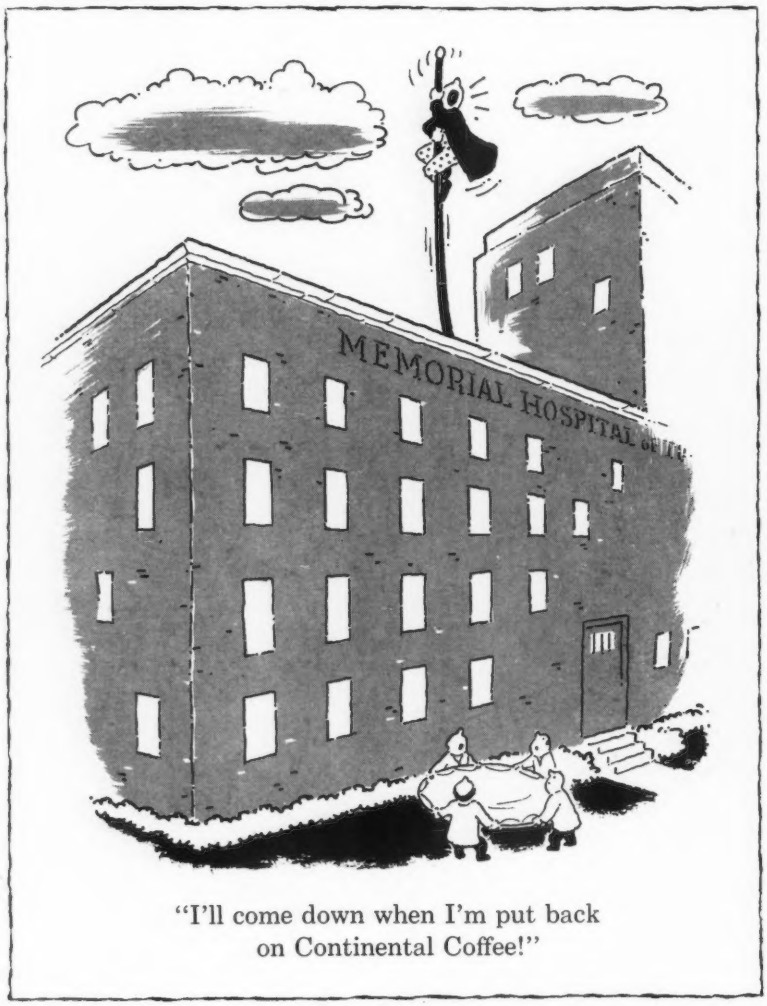
(f) Leadership and cooperation in community programs for senior citizens.

Other features of the program were a report by William C. Fitch, Director, White House Conference on Aging, on plans for the conference to be held next year; a report of a University of Chicago study on illness and complaints of illness among persons over sixty-five years of age; a session on "preparation for living" which considered health, retirement, the problem of an informed public, and the personal approach to aging.

Dr. Eugenia Whitehead, A.D.A. Education Chairman, and Chairman, Department of Home Economics, State University of Iowa, participated in a panel on "Prevention in Meeting the Challenge."

## Obituary

**Jessie M. Wetter.** The A.D.A. Headquarters office has received word of the death of Jessie M. Wetter on September 21 in Baltimore. Miss Wetter had been Chief Dietitian at Sinai Hospital for the past thirteen years, having been previously employed at Johns Hopkins Hospital. She was accepted for membership in the Association in 1935.




"I'll come down when I'm put back on Continental Coffee!"

Write for free trial package

Continental Coffee

AMERICA'S LEADING COFFEE

for Restaurants, Hotels and Institutions

CHICAGO • BROOKLYN • TOLEDO • SEATTLE

# How To Trim Food Service Expenses in the Face of Rising Costs

## KLENZADE TAILOR-MADE COMPLETE SANITATION PROGRAMS

Qualified Klenzade Technicians will make a complete survey of your food operation and set up sanitation procedures and schedules to meet your particular conditions. Klenzade will teach your kitchen personnel to "keep it clean . . . and keep it longer." Why not take advantage of this unique Klenzade service that adds new zest to your food, cuts costs, and freshens up your entire food facilities.

**What You Get!** Sparkling equipment, dishes, glasses, utensils. "Out-of-doors" atmosphere, free of "scullery" odors. Fresh clean food flavors — smiles instead of complaints. Elimination of detergent waste, over-use, duplicated products, inefficient cleaning.

*Write for Information on Complete Sanitation Survey*

**KLENZADE PRODUCTS, INC.**
BELOIT, WISCONSIN

# No!

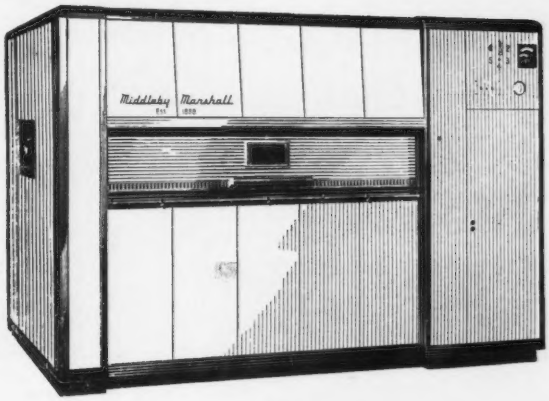
**No** *artificial color*
**No** *artificial flavor*
**No** *preservative added*

# BOMBAY

**CALIFORNIA VALENCIA ORANGE, GRAPEFRUIT & BLEND**

**THE H. R. NICHOLSON Co.**
**Kenshaw & Oakleaf Aves.**
**Baltimore 15, Md.**

Now that we've proclaimed what Bombay isn't . . . let's say what it is: A delicious, nutritionally-high base available at very low cost per serving. No refrigeration required. Leading hospitals, school systems, industrial cafeterias and other institutions use Bombay regularly. Write for sample and brochure without obligation!




**this is the revolving oven that has revolutionized quantity roasting, cooking, baking in the institutional field . . .**

# MIDDLEBY-MARSHALL

**With a new Middleby-Marshall Heavy-Duty oven you'll have bigger, JUICIER roasts, better baked goods — COOLER kitchens — plus REDUCED gas bills! More Schools, Hospitals, Hotels, Restaurants, Bakeries, etc., specify Middleby-Marshall Revolving Ovens than any other. They do this simply because M-M ovens are built for trouble-free performance year after year almost without end. For example, the patented Middleby-Marshall reel is so well made, it's guaranteed FOREVER!**

**Standard heavy-duty stabilization means no-tilt, no-spill trays. Controls easily accessible. Double suspension system—trays supported on both ends and hung on double reels to carry heaviest loads. All Automatic and Safety Controls included. All sizes and capacities available. Investigate a Middleby-Marshall oven now!**

**Middleby-Marshall is the ONE make that gives you ALL of the important oven features—and the best oven VALUE money can buy!**

*Send For Catalog!*

**World's Largest Manufacturer of Bake Ovens—Since 1888**

**MIDDLEBY-MARSHALL OVEN COMPANY**
**7680 W. Adams St., Chicago 6, Ill.**

Gentlemen: I am interested in the M-M oven I have checked below. Please send information, without obligation.

☐ **Model LUCKY 7**—Auxiliary Oven—6 or 7 bun pans.
☐ Model H—Revolving Tray—8-80 pans.
☐ Model L—Traveling Tray—10-38 trays.

Name .....
Address .....
City ..... State .....

**General Office & Main Plant: Chicago 6 ● Western Plant: Chubco, Oakland, Calif.**

# You can't shut out CANCER this way

**FEAR AND DELAY** are the two most potent allies of cancer. Too many Americans *needlessly* lose their lives to cancer . . . because they put off going to their doctors.

Many cancers are curable if treated *in time*. Even 15 years ago, medical science was saving 1 out of 4 cancer patients. Today, it's saving 1 in 3. The odds would be even better if people would have a health checkup annually and be alert to cancer's seven danger signals:

1. Unusual bleeding or discharge. 2. A lump or thickening in the breast or elsewhere. 3. A sore that does not heal. 4. Change in bowel or bladder habits. 5. Hoarseness or cough. 6. Indigestion or difficulty in swallowing. 7. Change in a wart or mole.

If your signal lasts longer than two weeks, go to your doctor to learn if it means cancer.

Having a health checkup every year is the smart thing to do—a checkup is your best insurance against cancer.

And it's equally smart to send your check to help in the continuing fight against this merciless killer.

**Send your check to "Cancer" in care of your local post office.**

AMERICAN CANCER SOCIETY


# *News of Products and Services*

*Gerber Products* has just issued a completely revamped version of its booklet, *Foods for Baby*, with the comment that the only thing which is unchanged is the title. Prepared by Edna Mae McIntosh, Gerber nutritionist, the booklet has an easy, direct-to-you approach which should prove popular with mothers of infants and young children. There is a "daily food plan" to help young parents in the area of general nutrition. Although major emphasis is placed on foods for the first year, special attention is also given to older babies, with a review of the gradual shift from strained to junior foods. Charts of growth curves for both weight and height for the first three years of life are shown.

Two new Crystal Tips automatic flaked ice makers are announced by *American Automatic Ice Machine Company*. The "Bits," Model A-12, powered by a 1/5-hp. hermetic compressor, will make, deliver, and store up to 120 lb. flaked ice a day; the other, A-36, powered by a ⅓-hp. hermetic compressor will produce up to 360 lb. flaked ice a day. Both units are automatically operated, and it is claimed that they will produce "Bits"-type flaked ice at a cost of about 6 cents per 100 lb. Standard with each model is a 170-lb. stainless-steel-lined bin for ice storage. Slanted fronts and large doors on the storage bins allow easy removal of ice. Every bin is insulated to keep ice fresh and free flowing. The manufacturer recommends "Bits" for drinking water and soft drinks; for displaying, serving, and storing fruits, salads, fish, and meats; and for manufacture and delivery of dairy products.

New hot-cold and freezer food storage equipment to bring efficiency and economy to smaller operations utilizes the building block principle and is centered around three compact THER-McCOLD Junior Food Bank Units introduced by *THERMcCOLD Corp.* The Junior units are offered in wall-mounted models for back-bar food warmers or hot and cold combinations, under-counter models, and upright models in combinations to fit any size and shape of space. Wall-mounted and under-counter installations in serving areas where floor space is limited, as well as pass-through models, are typical applications. The under-counter model provides additional work-table facilities, and upright models match present reach-in equipment. Junior units feature individual compartment design for storing hot cooked foods or cold food, have stainless steel tray slides spaced on 3-in. centers. Temperatures on warmers are thermostatically controlled between 100° to 200°F. Cold units operate between 38° to 40°F. within all cabinets.

American Gas Association approval has been awarded to the 50 Series Open Hearth Char Gas Broilers manufactured by *Bakers Pride Oven Co., Inc.* The "Grease-Flo Grate" constructed with wavy peaks, instead of a flat surface, eliminates frying and grilling. The charring flame sears in all juices and reduces meat shrinkage, producing the effect of a charcoal broil in aroma, taste, and appearance. The broiler is available in three sizes, in both floor and counter models. The units carry the seal of the National Sanitation Foundation.

A pair of unbreakable plastic ice cream dishes—one for sodas, one for sundaes — has been introduced by *Trump Plastics, Inc.* as part of its Trumpet-Ware line. The new dishes are transparent and are molded of styrene-acrylonitrile copolymer in a flared shape. The sundae dish has an 8-oz. capacity; the soda glass, 12-oz. The plastic is heat-resistant and withstands sterilization temperatures.

With a swish of discs, a cake pan coater for bakeries manufactured by *The J. H. Day Company* from steel supplied by Allegheny Ludlum Steel Corporation automatically applies a light, uniform film of grease to sides and bottoms of cake pans. Inverted pans are fed into the machine which positions the pan over templates. Both pans and templates move to the grease atomizing chamber. Eight conical discs, rotating at 3500 r.p.m. atomize grease and apply it to the pan. No nozzles and no filters are needed. The design keeps grease from flying over the reverse side of the pan resulting in less waste. The unit is constructed of welded stainless steel tank and body, stainless crumb screen, and frame members. Motors are enclosed; thus the unit may be hosed down without damage to the machine or corrosion of the stainless steel.

The new portable Model IPT60 stainless steel unit offered by *Lincoln Manufacturing Company, Inc.* is designed for transporting food on trays or pans. The unit accommodates twelve 18- by 26-in. trays, twenty-four 14- by 18-in. trays, or twenty-six 12- by 20- by 2⅝-in. pans. Pans of any depth with lids may be accommodated through adjustment of the removable support clips.

A 20-oz., vacuum-type pitcher for cold beverages and a matching tray have been introduced by *Legion Utensils Co., Inc.*, for hospital bedside use. The pitcher, designed to prevent condensation, is constructed with a stainless steel inner and outer shell; seamless drawn, hinged cover; wide mouth for easy cleaning; and well designed lip for pouring. Both utensils may be autoclaved or sterilized with a strong detergent.

By correlating recent population projections and known trends in coffee consumption since 1950, the *Pan-American Coffee Bureau* foresees doubling of coffee consumption in the next twenty years. In a thirty-page "Special Report," the factors govern-

fmc Utensil Washer

Keeps Pots and Pans SPICK and SPAN

"Easy does it" with the FMC Utensil Washer! All manner of pots and pans, from pie tins to garbage cans, are cleaned and sanitized in less than 2 minutes! Learn how high pressure, high velocity jets of hot water alone do the pot cleaning job in half the time. Save time, labor, supervision and help-turnover! Write for new Bulletin KB 591 today.

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

*Putting Ideas to Work*

FOOD MACHINERY AND CHEMICAL CORPORATION
**Kitchen Equipment Department**
General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

*Tasty, Tempting*

**MEALS IN MINUTES!**

JAMES RIVER BRAND FINE FOODS
Just Heat and Serve!

**Dietitians Tell Us:**

"James River Foods add menu variety . . . cut kitchen workload!"

No wonder dietitians so often select James River foods! Foods so delicious they're first choice in fine restaurants! Yet so easy to fix—so economical to use—such a little goes a long, long way! For instance:

★ 1 30-OZ. CAN JAMES RIVER MEATY, PURE PORK BARBEQUE MAKES 20 BIG, TASTY SANDWICHES!

★ 1 50-OZ. CAN JAMES RIVER REAL OLD FASHIONED CHICKEN BRUNSWICK STEW MAKES 6 HEARTY, TEMPTING SERVINGS!

There's no over-stocking, for James River foods are readily available! Increase your storage volume, too. No bulky cans—dietitians say "they're the ideal size!"

**Order From One Source:**

**JAMES RIVER Pork Barbeque • Beef Barbeque • Turkey Barbeque • Beef Stew • Beef with Gravy • Chicken Brunswick Stew • Chili Con Carne • Chili Hot Dog Dressing • Deviled Ham Spread • And AMBER BRAND Smithfield Ham and Bacon • Sliced Smithfield Ham • Smithfield Ham Spread**

*Free!* Our booklet containing complete menu suggestions by leading dietitians.

*The Smithfield Ham and Products Co., Inc.*
Smithfield 31, Va.

**More Vitamin C than in Fresh or Frozen Orange Juice!**

New INSTANT Lasco® ORANGE BREAKFAST DRINK GRANULES

**Each 4-oz. serving contains more than 70 milligrams of Vitamin C.**

√ *Nothing to add but water*
√ *High Nutrition—Low Acidity*

So easy to prepare! A 2-lb. vacuum-packed tin of the new Lasco Orange Breakfast Drink Granules and 2 gallons of water make *69 four-ounce servings* . . . delicious, nutritious and economical!

And Your Old Favorites
DELUXE Lasco® FROTHY™ GRANULES
—in 15 delicious flavors (Orange, Lemon, Lime, Grape, Pink Lemon, Fruit Punch, Orange Pineapple, etc.). An 8-oz. serving contains 30 milligrams of Vitamin C (and 4000 U.S.P. Units of Vitamin A in some flavors). The 10-oz. jar makes 7 gallons of beverage *for less than 2¢ an 8-oz. glass!*

**WRITE** for complete details!

af INC.

**ALLEN FOODS, INC.**
*Finer Foods for Hotels and Institutions*
4555 GUSTINE • ST. LOUIS 16, MISSOURI

ing the increase are outlined. Population growth promises an automatic increase in coffee consumption of 37 per cent. Two other factors will contribute to the increase. The first, promotion of the coffee-break, which started with 2.38 cups a day in 1950, is expected to reach 3 cups by 1960 and 3.52 in 1980. The second factor is the cup-yield rate. Consumer research conducted by the Bureau has established that household coffee is being brewed at the rate of 64 cups per pound compared with 46 cups in 1949. The studies show that an average of 13.8 cups are currently being made from 1 oz. soluble coffee. The industry advocates promotion and advertising of the more full-bodied brew prevalent in 1949 and suggests a cup yield of 50 cups per pound for regular coffee, and 12.5 cups per ounce for soluble coffee.

A new slicer suited to the needs of institutional food service organizations has been introduced by *The Hobart Manufacturing Company*. The new model No. 1612 slices meats (hot or cold), fowl, fish, cheeses, breads, fruits, and vegetables. The angle of the feed trough accommodates meats, cheeses, and other foods up to 12 in. in width or 7½ in. in diameter. The new model becomes multi-purpose through the use of interchangeable food chutes and adjustable fences permitting random slicing of fruits, vegetables, and meats. The slicer is powered by a totally enclosed ¼-hp. motor. Other features are: a stainless steel knife with easy accessibility for cleaning; anodized aluminum for all parts in contact with food, except the knife and knife guard; ribbed feed trough and gauge plate for smooth feeding; controlled slicing to any thickness up to 1¼ in.; feed grip with cast aluminum teeth, which swings out of the way when not in use; and removable prongs to help hold off-shaped pieces of food during slicing.

A six-page catalog printed in two colors is available from Meals-on-Wheels System of *Crimsco*. The catalog features the new "Electra" mobile food service unit for delivering hot foods hot and cold foods cold.

Black line geometric figures interspersed with golden tips of grain form the border design on the new "DeVille" pattern of *Syracuse China Corporation*. DeVille is one of the stock patterns in the Hospitality Group designed for institutional use. The china is resistant to cracking or chipping, and the pattern, under glaze, will not fade or wash off.

The *Swartzbaugh Manufacturing Company* announces the addition to its line of new "Ideal" Tray and Dish Lifters. Precision springs automatically bring dishes to serving position. By rotating an adjustment ring, dishes above the top-deck level may be placed at any height desired. The tray and dish lifters are constructed of stainless steel. Four swivel casters permit use as a mobile or stationary unit. The unit is available in one-, two-, or four-stack dish lifters, either heated or unheated. Tray lifters are available for standard size trays. A full variety of rack lifters is also available.

A 400-lb. icemaker has been introduced by *Koch Refrigerators, Inc.* The basic machine for the 400-lb. unit is interchangeable with the 200-lb. bin. The icemaker produces irregularly-shaped ice nuggets, 1 by ¼ by 5/16 in. size. The ice is free flowing and will not stick together. The ice bin is lined with stainless steel. Standard finish is silver-lustre baked enamel. A No. 4 finish stainless steel is also available for working surfaces.

Sirups, dressings, and condiments have been added to the ANCO portion-control line of *L. L. Antle & Company, Inc.* Waffle sirup, honey, mayonnaise, French dressing, salad dressing, mustard, and catsup are now available. Blackberry, mint, and black raspberry jellies have been added to the jam and jellies. Packed in round plastic containers, the jellies and jams weigh ⅝ oz. per portion.

Two new gelatin and fruit desserts in the LeGout line are offered by *Fearn Foods Inc.* "Golden Desire" combines orange gelatin with pieces of apple, and "Scarlet Desire" combines cherry gelatin with apple pieces. Desserts or salads may be made by adding boiling water, chilling, and serving. They are available in 2-lb. institutional cans which yield forty-eight, 4-oz. servings at an estimated cost of 3 cents each.

End Mixing!
Save Time!
LSM
milk
with NEW
LOW SODIUM MILK
A Natural, Whole
LIQUID MILK
for low-salt diets
Pour LOW SODIUM MILK right from the can to patient's glass. Save time because there's no mixing. And each glass is assured the same natural consistency. LOW SODIUM MILK can be used whenever a sodium restricted diet is indicated.
Low Sodium Milk fortifies the nutritional value of any diet for it contains many of the proteins, vitamins and minerals so essential for good health and growth.
Each quart contains approximately 5% carbohydrates, 3.5% protein, 3.5% butterfat, 675 calories, AND LESS THAN 50MG. SODIUM.
Low Sodium Milk also available with low fat content
For more information about LOW SODIUM MILK write:
(east of Mississippi)
CANNED DAIRY PRODUCTS, INC.
880 Fulton Street • Pittsburgh 33, Pa.
Phone: FAirfax 1-7600
(west of Mississippi)
LOW SODIUM DAIRY PRODUCTS
346 Rose Avenue • Venice, California
Phone: Exbrook 6-3165

# Shortest and fastest route

*Photo, courtesy Hube Henry, Hedrich-Blessing, Chicago, Ill.*

Kitchen in Southwestern Michigan T.B. Sanitarium, Kalamazoo, Michigan showing trays being prepared on an Olson tray make-up Conveyor, and portable, caster-mounted equipment on one side to permit seasonal variation of foods. In conjunction with the Conveyor, this hospital uses an Olson Model B ascending Subveyor for food service to the various floors, plus a Model A descending Subveyor for returning soiled dishes to a separate washing room.

## Meals on schedule with less help

Olson Subveyor and Conveyor System moves trays from kitchen to patient faster, safer, quieter—and actually saves thousands of man-hours and dollars every year. Dietary department controls meal routing at all times—no elevator delays, no side-tracking, no noise or confusion. Olson mechanized food service cuts tray handling to a minimum, yet provides greater supervision of tray make-up and routing. Olson Subveyors and Conveyors, in combination, are the most efficient, most economical system of centralized food service in hospitals of 100 beds or larger. Hospitals of all types, throughout the country, are serving meals on schedule—at a savings—with Olson.

***Send for installation and plans booklet, "Food Service in the Modern Hospital" . . . it's a must for hospital personnel and architects concerned with new construction and remodeling.***

# OLSON CONVEYORS

MANUFACTURED BY
**SAMUEL OLSON MFG. CO., INC.**
2424 Bloomingdale Avenue Chicago 47, Illinois
DIVISION OF CHERRY-BURRELL CORPORATION

When desserts must stay tempting for indefinite periods after tray make-up, the answer is to top them with Rich's *diamond process* Whip Topping. It's so stable that there's no sign of "weeping", shrinking or discoloring for more than 24 hours...even without refrigeration. It even permits you to finish your dessert preparation well in advance of rush periods.

**CONTAINS NO CHOLESTEROL**

Note, too, that Rich's *diamond process* Whip Topping while low in calories tastes rich and creamy. It has a vegetable base and contains no animal fats whatsoever. Therefore, it contains *no cholesterol* and melts sharply and cleanly in the mouth. Rich's may be stored for weeks without danger of spoilage, either frozen or with ordinary refrigeration. Unmatched economy, for one quart whips to one gallon. Excess whip can be saved for use the next day, often without rewhipping.

If you're not familar with all the wonderful advantages of Rich's *diamond process* Whip Topping, ask your frozen food distributor for a demonstration, or write us: Rich Products Corp., 1148 Niagara St., Buffalo 13, N. Y.

RICH'S *diamond process*
WHIP TOPPING

# INDEX TO VOLUME 35

The following abbreviations indicate the source of material indexed: "ab," abstract under Current Literature; "br," Book Reviews; "cc," Current Comment; "ed," Editorial; "f," filler; "l," Letters to the Editor; and "nn," News Notes. An asterisk indicates an original article in this *Journal*. Book Reviews appear in the subject index under the heading, "Book Reviews." The Author Index, which follows the subject index, includes only the names of the authors of original material appearing in this *Journal* in full or abstracted in the editorial section or in fillers, and the authors and reviewers of books reviewed.


A

Absorption
  intestinal, in pernicious anemia, ab 500
  of protein and carbohydrate, ab 498
Acceptance Service, USDA
  for meat, nn 1210
  for poultry and eggs, nn 520
Accidents, cutlery, protection from, ab 294
Accounting in dietary department, cc 1173
Acid-base balance in essential hypertension, ab 726
Acne
  and diet therapy, *927
  unsaturated fatty acids in, ab 968
Acronizing
  of frying chickens, ab 600
  methods for beef, ab 1293
Additives
  in foods, ab 159
  lists of legal, published, f 942
  new law on, ab 378, ab 506
Adenosine triphosphate (ATP) in diabetes, ab 58, ab 58
Administration
  art of, ab 602
  business-management-trained person assists in, *476
  in a social system, ab 982
Administrators
  help dietitians grow, f 676
  qualities of, ab 612
Adolescents
  boys, thiamine needs of, ab 278
  diet book for, br 266
  fat changes in, ab 980
  food intake, adequate, ab 594
Adrenal ascorbic acid, ab 272
Adrenalectomy and carbohydrate metabolism, ab 598
Adrenocortical activity, 17-ketogenic steroid excretion, as index of, ab 164
Adrenocortical function and ascorbic acid deficiency, ab 160
Advertising, evaluating protein quality for, *574
Age
  body potassum as function of, ab 1297
  effect on beef preferences, ab 972
  and utilization of ascorbic acid, *139
Aged
  amino acid tissue hunger in, ab 1078
  booklets to prepare for retirement, nn 304, nn 990
  conference on health care of, nn 866
  cooking skills of, ab 974
  desserts for, ab 394
  fat absorption in, ab 1293
  feeding of, ab 610
    in groups, *939
  food for, ab 1092
  food guide published, nn 868
  home-delivered meals for, cc 146, cc 149, ab 840
  homes for
    food service in, l 858
      manuals for, nn 870
    nutrition and food service in, bibliography, nn 194
  hypercholesteremia, dietary management of, ab 498
  lipid metabolism in, ab 490, ab 974
  milk use by, booklet on, nn 192
  new careers after 60 urged, f 822
  nutrition of, ab 162, nn 300, ab 602
  nutrition education for, ab 1304
  osteoporosis in, ab 498, ab 602
  overweight in, ab 594
  protein, serum in, ab 161
  serum lipids, effect of unsaturated fatty acids in, ab 974
  taste sensitivity in, ab 972
  vitamin $B_{12}$
    in senile dementia, ab 972
    serum, in, ab 622
Aging, conferences on, nn 1112, nn 1338
Air conditioners, ab 988
Alaska, infections in
  enteric, in, ab 159
  intestinal, in, ab 504
Albumin, plasma, catabolism of, ab 163
Alcohol
  absorption, ab 48
  caloric value of, ab 840
  effect on liver, ab 1082
  in hypercholesteremia, ab 608
  metabolism of, ab 840
    carbohydrate in, ab 602
  "scrap iron" intoxication, ab 52
Algae in space nutrition, *16, ab 1293
Allergy
  in Canada, ab 1291
  and diet therapy, *926
  food, ab 980
    and asthma, ab 602
  to hard-shelled clams, ab 52
Aluminum cans, ab 170
Ambulation, dining room service for patients, f 1054
Amebiasis, liver function tests in, ab 1295
American Dietetic Assn., The
  Annual Meeting, 42nd, 374, 488, 622, 742, 746, 828
  boards, 1240
  committees, 96, nn 410, 1240
  continuing education program, *66
  Copher Award goes to D. F. Turner, ed 1060
  *Handbook of Diet Therapy* published, br 1182
  *History* published, ed 1058
  Johnson, D., President, ed 945
  joint committees, 1242
  Kellogg Foundation Grant to develop food service supervisors' course, ed 1063
    Van Horne, M., appointed Project Director, nn 1330
  Loan Fund, ed 947
  Lufkin, P. E., receives L. J. Roberts Essay Award, ed 1062
  Mead Johnson Awards
    for dietetic interns for 1959-60 announced, ed 1063
    for graduate education for 1959-60 announced, ed 1063
    rules of, ed 948
  membership requirements, new, ed 253
  Nominating Committee report, ed 250
  officers for 1959-60, nn 752
  President's report for 1958-59, *1139
  Roberts, L. J., Essay Award
    goes to P. E. Lufkin, ed 1062
    rules of, ed 948
  Rose, M. S., Fellowship
    goes to G. W. Strain, ed 1062
    rules of, ed 947
  Strain, G. W., receives M. S. Rose Fellowship, ed 1062
  Turner, D. F., receives Copher Award, ed 1060
  "View from the Mountain" film, use of, nn 876
  Wilder, R. M., made honorary member, ed 1063
American Home Economics Assn., 50th anniversary, nn 298, nn 862
American School Food Service Assn., resolution on management, f 744
Amines, catechol, fruits and serotonin, ab 836
Amino acids
  affected by radiation, ab 1295
  assay method for availability, ab 1295
  derangement in maple sirup urine disease, ab 380
  dietary protein level and imbalance, ab 1084
  in egg, ab 726, ab 976
  excretion
    in pregnancy, ab 1200
    in young women, ab 608
  in flour, f 1051
  in high-protein meal, ab 382
  hunger in tissue, ab 1078
  interrelationships with vitamins and hormones, *929
  in irradiated peas and Lima beans, ab 1084
  lysine limits balance in wheat gluten, ab 1295
  in mushrooms, ab 161
  in peanut butter, ab 726
  in pork, ab 726
  and renal enzyme adaptation, ab 278
  requirements, *929
  in shark and skate protein, ab 1072, ab
Amino acids, *continued*
  1072, ab 1072, ab 1072
  special functions of, *932
  supplementation, ab 840
    corn protein, ab 384
    protein, ab 48
    poor vegetarian diet, ab 1074
  thyroxine and, ab 730
  in turkey meat, *274, *1251
  in wheat, ab 160
    research on, ab 610
Ammonium in bank blood, ab 388
Amylase, blood
  activity, ab 1295
  and carbohydrate metabolism, ab 1291
Androgens
  after gastrectomy, ab 840
  and nitrogen retention, ab 1293
Anemia
  hypochromic, oral iron in, ab 278
  in infancy, ab 50
  iron
    deficiency, treating, ab 386
    in kwashiorkor, ab 602
  megaloblastic
    folic acid metabolites, in, ab 1184
    of pregnancy, ab 386
  nutritional, ab 156
    blood volume in, ab 842
  pernicious, ab 598
    depression in, ab 504
    failure of oral therapy in, ab 1291
    folic acid in, ab 384
    intestinal absorption in, ab 500
    treatment of, ab 610
    vitamin $B_{12}$ in, ab 384
      need in, ab 840
  sickle cell, in pregnancy, ab 966
  world problem, *445
Animals, zoo, arteriosclerosis in, f 44
Anorexia, problem of, in patients, ab 1296
Antarctic expeditions, nutrition in, ab 163
Anthropology
  food taboos in Africa, ab 730
  and nutrition, ab 730
Antibiotics
  Acronizing methods for meat, ab 1293
  effect on spores, ab 970
  in food preservation, *232
  in foods, problem of contamination, ab 1198
  and food spoilage fungi, ab 498
  irradiation of meat treated with, ab 160
  to keep fish fresh, f 555
  lower heat requirements in canning, ab 1194
  in milk, f 1157, ab 1294
  to preserve fryers, ab 600
  residues in meat, ab 1293
  treatment of turkeys, ab 274
Anti-coronary club, ab 1186
Antidiuretic hormone activity, ab 159
Antioxidants to preserve cereals, ab 160
Antique silver, cc 582
Appetite and hunger, ab 48
Apples
  evaporated, ab 174
  canned, fresh and frozen compared, f 1289
Apricots, drained weight of, ab 838
Arataeus, biographical note, f 234
Arctic warfare, biologic factors in, ab 1084
Arichidonic acid, effect on serum cholesterol, ab 1184
Armed forces, food preservation problems for, ab 720
Army
  composition of food served, *462
  mid-year dietetic internship begun, nn 990
  new rules for retirement pay, nn 1310
  nutrition standards, ab 612
Arsenic poisoning, ab 282
Arteriosclerosis (see also Atherosclerosis)
  and calcium, ab 53
  and social pressure, f 44
Arthritis
  bibliography on, ab 596
  treatment with niacin, ab 1291
Artificial sweeteners, ab 162, f 240
Ascorbic acid
  adrenal, ab 272
  biosynthesis of, ab 966

deficiency and adrenocortical function, ab 160
to fortify milk, ab 724
loss in fresh vegetables, ab 1078
measures quality of frozen strawberries, ab 272
retention
in asparagus, ab 278
in cooked vegetables, *578
in cooking broccoli, *355
in electronic cooking, *241
saved by proper vegetable storage, f 815
serum, and climatic heat, ab 842
status of women, ab 164
utilization, ab 276
in relation to age and climatic temperature, *139
Asparagus, holding temperature, effects on, ab 278
Aspiration of food, danger of, ab 52
Asthma
in children, personality factors in, ab 980
and food allergy, ab 602
Atherosclerosis
aortic, in three countries, ab 376
booklet on, nn 754
and cholesterol, ab 596, ab 970
and diet, ab 380
and essential fatty acids, ab 155
experimental, ab 276
hereditary environment and, ab 378
and nutrition, ab 376
research opportunities abroad, *671
in South Carolinian and Haitian Negroes compared, *919
in swine, ab 159
world problem, *446
Attitudes, *268
Audio-visual aids for school lunch, nn 518
Australia
dietetics in, as seen by American, f 801
infant feeding in, ab 1292
Aviation, hypoglycemia in flight, ab 840
Azotobacter, vitamin $B_{12}$ in, ab 53


## B


Back strain, preventing, ab 854
Bacteria
in frozen food
chicken, ab 972
pies, ab 970
ham loaf, ab 972
Italian rice, ab 972
growth, in protein-base sandwich fillings, *131
in hospital bedside carafes, ab 280
in prepackaged meat, ab 272
surface, on packaged frankfurters, ab 970
Bananas
serontonin and catechol amines in, ab 1084
staple in low-sodium diets, ab 165
Banquets, planning of, ab 172
Bantu, coronary and cerebrovascular disease in, ab 834
Beans
green
effect of irradiation on, ab 1076
fresh, canned, and frozen compared, *1270
Lima, effect of irradiation on amino acids in, ab 1084
snap, purchasing, ab 988
Beef
Acronizing metho 's for, ab 1293
changes due to radiation in raw, ab 1292
color in prepackaged frozen, ab 274
consumers' preferences for, ab 1074, ab 1194
effect of age on tenderness, ab 972
irradiated, and vitamin K deficiency, ab 1295
myoglobin, effect of cooking on, ab 1074
preference studies, ab 972, ab 1293
publication on VA use of, nn 872
purchasing specifications published, nn 1210
roasts, Choice, effect of size and internal temperature on cooking, *569
roasting in foil, *1255
water retention in, ab 1076
Berries, maintaining freshness of, ab 51
Beverages, effect on gastric secretions after gastric resection, f 950
Bible, foods mentioned in, *816
Biscuits, lysine in, *469
Blood
ammonium in, ab 388
amylase
activity, at 1921
and carbohydrate metabolism, ab 1291
coagulation, and various fat preparations, ab 159
potassium in, ab 388
pressure
and dietary fat in older women, *935
and salt intake, f 130
serum, antirachitic activity of, ab 1082
volume in nutritional anemia, ab 842
Blueberries, frozen, nn 996
Blueprints, putting safety features in, ab 296
Body weight
and dietary fat in older women, *935
and surface area in studying body weight, ab 598
Bologna, simulated, soybean protein for, ab 970
Bone
mineral content of, ab 162
strontium in human, ab 500
**Book Reviews** (see also Government publications, Food and Agriculture Organization, and World Health Organization)
Alcoholism, The Nutritional Approach, 1182
American Culinary Art, 266
Arterial Wall, The—Aging, Structure, and Chemistry, 1290
Author-Publisher-Printer Complex, The, 154
Basic Bacteriology—Its Biological and Chemical Background, 1290
Betty Crocker's Dinner for Two Cook Book, 154
Boy's Cook Book, The, 964
Buffet Catering, 266
Chemistry and Technology of Cereals as Food and Feed, 964
Cholesterol, 266
Classic French Cuisine, The, 1182
Conversion Factors and Technical Data for the Food Industry, 1182
Cookbook for Diabetics, A, 964, 1070
Deficiency Disease, 154
Diabetic Menus, Meals and Recipes, 592
Dietary Prevention and Treatment of Heart Disease, 154
Diseases of Metabolism, 716
Eat Honey and Live Longer, 484
Eat Well and Stay Well, 484, 1 858
Essentials of Pediatrics, 154, 592
Essentials of Therapeutic Nutrition, 1070
Family Handbook of Home Nursing and Medical Care, The, 716
Family Medical Encyclopedia, The, 592
Far Eastern Epicure, The, 266
Fast and Fancy Cookery, 964
Finest in Middle East Recipes, 824
Food for Better Living, 716
Food for Better Performance, 592
Food—The Yearbook of Agriculture, 1290
Food an l You, 154
Food Values in Shares and Weights, 964
French Family Cooking in Plain English, 824
Gardening for Gourmets, 716
Gastronomique, 154, 592
Goodly Heritage, A, 266
Guinea Pig in Research, The, 154
Handbook of Diet Therapy, l 512, nn 764, 1182
How to Enjoy Life after Sixty, 716, 824
How to Lose Weight the Doctor's Way, 484
Insulin Treatment in Psychiatry, 964
June Platt Cook Book, The, 266
Let's Have Healthy Children, 1290
Low-Fat Cookery, 592
Low-Fat Diet—Reasons, Rules, and Recipes, 964
Manual of Nutrition, nn 994
Menu Maker and Party Planner, 484
Metabolism of Sulphur Compounds, The, 154
New and Nonofficial Drugs—1959, 824
Nursing Home Management, 964, 1182
Nutrition and Atherosclerosis, 1290
Nutrition in the Elementary School, 154, 266
Nutrition in Health and Disease, 1290
Nutrition for Practical Nurses, 154
Open Door to Health, 716
Our Food, 1182
Overfed But Undernourished, 716
Pamphlets, How to Write and Print Them, nn 626
Recommended Methods for the Microbiological Examination of Foods, 266
Some Tropical South Pacific Island Foods—Composition and Nutritive Value, 592
Symposium on Protein Structure, 266
Teen-Age Diet Book, The, 266
That the Patient May Know, 964
Training Guide for Restaurant Sales Personnel, A, 1290
What We *Do* Know about Heart Attacks, 266
Borden Award to M. B. Patton, nn 862
Botulism, ab 1297
Boys, adolescent, thiamine needs of, ab 278
Brain extract, response to, ab 163
Brainstorming, ab 732
Bread
high milk-protein, recipes, cc 1178
nutritive value of commercial, *245
protein, nutritive value, ab 968
staling, f 246
white, new formula by Navy, nn 628
Breakage, china, reducing, ab 850, ab 1204
Breakfasts, fatty vs. normal, and stomach-emptying, ab 161
Breast feeding, ab 56, ab 834, ab 978
and deodorant, ab 53
study of, ab 54
Broccoli
ascorbic acid retention in cooking, *355
carotene retention in cooking, *355
effect of irradiation on, ab 1076
palatability with different cooking methods, *359
Broiling, hearth, terminology, f 244
Browning reaction and irradiation, ab 622
Brucellosis, incidence of, ab 282
Budgeting, ab 388, cc 1173
Business management training, value in dietary administration, *476


## C


Cafeterias, operation of, ab 390
Cake
factors affecting staling, ab 836, f 1031
freezing and defrosting of, ab 498
mixes vs. conventional, f 581
Calcium
absorption, effect of lactose on, ab 1084
adaptation to low intake, *23
and arteriosclerosis, ab 53
availability in vegetables, ab 726
intake, adaptation to, ab 974
low-intake, effect on phosphorus retention, *31
in 95 foods, *1170
requirement, *23, ab 978
adult, ab 500
utilization
and lactose, ab 1295
from milk, ab 52
in urban diets, *1283
Calories
in alcohol, ab 840
consumption in U.S. per capita in 1958, f 353
expenditure in walking, ab 1078
in Hawaiian diets, *122
intake
and energy output, ab 376
and linoleic acid, ab 384
in mountaineering, ab 598
Calorimetry, history of, ab 492
Canada
allergy study in, ab 1291
hospital accreditation in, ab 516
infantile scurvy in, ab 163
Cancer
-causing diets, salt mixtures in, ab 280
a collagen disease secondary to nutritional deficiency? ab 836
plant extract as possible fighter of, f 1274
stomach, ab 53
waxed containers as possible cause, ab 1297
Canned foods
apples vs. fresh, f 1289
cut costs, ab 60
green beans compared with fresh and frozen, *1270
leaflet on sizes, nn 88
Canning
antibiotics lower heat requirements in, ab 1194
developments in, *230
Cans
aluminum, development of, ab 170
tin, corrosion in, ab 974
Carafes, bedside in hospitals, bacteria in, ab 280
Carbohydrate
absorption, ab 498
metabolism
and adrenalectomy, ab 598
in alcoholism, ab 602
and blood amylase, ab 1291
after gastrectomy, ab 836
research in, *113
utilization, and insulin dosage, ab 490
Cardiopulmonary function and obesity, ab 848
Career guidance, use of film "View from the Mountain," nn 876
Careers after 60 urged, f 822
Caries
and coarse diets, ab 164
and dairy products, ab 726

and diet, ab 53, ab 270, ab 610, ab 612
effect of time of diets on, ab 164
fluorides, ab 504, ab 730
from high-sucrose diets, ab 728
and salivary protease activity, ab 280
tooth composition, and diet, ab 728
Carob, composition of, ab 600
Carotene, retention in cooking broccoli, *355
Carotenoids
in canned cling peaches, ab 1074
effect of irradiation in vegetables, ab 1076
Case-study method in educating dietetic interns, *338, *343
Catechol amines in bananas, ab 1084
Catering, buffet, br 266
Cauliflower, purple, f 471
Celery, dermatitis from, ab 382
Celiac disease
diet and, ab 1186
gluten-free diet in, ab 164
history of, *1158
Centralized food service, ab 62, *556, ab 616
Cereals—see also individual types
anti-oxidant treatment of packages, ab 160
cook book published, nn 882
improvement with defatted wheat germ, ab 160
recent developments in, ab 1293
Cerebrovascular disease in Bantu, ab 834
Ceylon, dietetics in, l 860
Chaplain and dietitian can cooperate, cc 821
Cheese
cost of marketing in South, nn 756
flavor, factors in, f 590
and serum cholesterol, ab 52
Chemicals in foods, *19, ab 159
Cherries
low-moisture, red, sour, pitted, ab 161
red sour pitted Montmorency, sweetness preferences for, ab 970
Chevruel, M. E., biographical note, f 792
Chicken
Acronizing fryers, ab 600
flavor, factors affecting, ab 600
frozen
bacteria, palatability, and thiamine in, ab 972
time-temperature tolerance of, ab 722
irradiated, storage of, ab 1076
tenderness of, ab 380, ab 600
Children
asthmatic, personality factors in, ab 980
bibliography on, f 1286
dental status and food habits, ab 1086
feeding chronically ill, ab 160
food attitudes and preferences, *704
growth patterns in Ohio, *457
Guatemalan, growth and vitamin $B_{12}$, ab 594
hospitalized, food for, ab 850
kwashiorkor, *441
malnourished, metabolism of, ab 970
menu planning for, ab 184
obesity in, ab 52, ab 608
overnutrition in, ab 1198, ab 1292
teeth of, in London, ab 270
tropical, preschool, protein-calorie malnutrition in, ab 502
underweight, treatment of, ab 836
White House Conference on, nn 1114, f 1286
China
care and handling of, ab 850
washing, ab 614
Chinese vegetable cookery, ab 384
Chlorothiazide, effect on blood pressure, ab 166
Chlorpropamide in diabetes, ab 1296
Cholesteremia, experimental diet in studying, ab 726
Cholesterogenesis in obese mice, ab 834
Cholesterol
in American Indians, ab 844
blood-lowering effects of unsaturated fatty acids, ab 1072
and co-enzyme A, ab 272
and diabetes, ab 58
and dietary fats, ab 376
effect
of pituitary hormone on, ab 1074
of safflower- and corn oil-pyridoxine mixtures on, ab 724
metabolism
effect of food restriction on, *115
in rats, ab 164
plasma, origins of, ab 155
safflower oil to reduce serum, ab 376
serum
and atherosclerosis, ab 596, ab 970
and cheese, ab 52
and corn oil, ab 724
and diet, ab 840
and exercise, ab 594
and fat intake, ab 376
in heart disease, ab 1198
and linoleic acid, ab 974
lowered by polyunsaturated fatty acids, ab 1186
and niacin, ab 50
and protein, ab 722
response to arachidonic acid, ab 1184
and safflower oil, ab 376
and saturated fatty acid intake, ab 52
and soya oil, ab 382
and water deprivation, ab 1078
synthesis
inhibited by vanadium, ab 1082
and niacin, ab 1294
Chromatography, gas, ab 1090, ab 1296
Cirrhosis, serum proteins in, ab 52
Citrus fruit, religion and spread of, ab 388
Civil defense, booklet on home economist's role in, nn 78
*Cl. botulinum* and radiation, ab 496
Clams, hard-shelled, allergy to, ab 52
Clay-eating women, *810
Cleaning
acid detergents, ab 1302
compounds, ab 398
Coagulation, blood, and egg intake, ab 608
Cockroaches as vectors, ab 282
Coconut
frozen, bacteria in, ab 1076
meal, proteins of, ab 1072
Codfish, food poisoning from, ab 612
Co-enzyme A and cholesterol, ab 272
Coffee
consumption in U.S., nn 1115
effect of holding, ab 838, ab 1076
flavor and chemicals in water, ab 272
instant, sodium in, ab 1196
made with hard water, nn 1318
niacin in, ab 1074
Cold environment
and fatty cholesterol livers, ab 1084
and riboflavin deficiency, ab 1084
Colitis
in jails in India, ab 500
ulcerative, management of, ab 834
College food service
by contract, ab 1298, ab 1298
extra services in, f 366
student employees in, cc 364
waiter training, ab 1088
vending machines in, ab 504
Color, effect of cooking on vegetables, *578
Columbia University Institute of Nutrition Sciences, ab 1196
Communications, horizontal, ab 172
Community nutrition
nutritionists' role in, *793
program
for American Indians, *905
to fit changing needs, *789
Concentrates, soup, vs. meat-stock soups, f 153
Conferences, planning, ab 396, ab 848
Connecticut, dietary consultant's work in, *472
Consultants, dietary
in community health programs, *793
food service, value of, ab 174
for nursing homes, f 1269
help in hospital planning, ab 178
work in Connecticut, *472
Consumption
food, trends in U.S., ab 980
of wine, ab 51
Containers, waxed, as possible carcinogens, ab 1297
Contamination, radioactive, permissible levels in intake, ab 722
Convenience foods, ab 398, ab 732, ab 732, ab 732
Conveyors, ab 398
Cookery
effect
on beef myoglobin, ab 1074
on vegetables, of method, *578
electronic vs. conventional, for vegetables, *241
fat filtration, benefits of, ab 984
with fats high in polyunsaturated fatty acids, *119
film on fish, nn 518
foil vs. conventional roasting, *1255
meat, ab 1300
vegetable, ab 384, ab 980
Cooks, fry, training of, ab 60
Copher, M. H., Award goes to D. F. Turner, 1060
Copper
poisoning from vending machines, ab 56
serum, ab 612
Corn
nutrients in tortillas, ab 51, ab 51
protein
effect of radiation on, ab 498
supplemented with amino acids, ab 384
Corn oil
cook book on, nn 882
effect on serum cholesterol, ab 724
-pyridoxine mixture, effect on serum cholesterol, ab 724
Corrosion in tin cans, ab 974
Cost
analysis for the dietary department, cc 1173
of apples, canned vs. fresh, f 1289
control of
food, ab 174, ab 288
method, ab 1096
by scales, ab 398
labor, estimating, ab 1088
meat-cutting method to save, ab 1096
reducing, ab 58, ab 60
through use of canned foods, ab 60
of week's food in U.S., f 358
Cottage cheese
amino acid availability in, ab 726
storing of, nn 198
Council on Youth Fitness, A.D.A. resolution on, nn 1216
Counseling interviews, ab 178
Counters, sanitation of, ab 168
Curing, ham, salt accumulation during, ab 1186
Cutlery, usage, ab 734
Cyanacobalamin (see vitamin $B_{12}$)

**D**

Dairy products
and caries, ab 726
consumption in various countries, f 671
Decentralized food service, ab 62
Decision-making
dietitians' responsibility in, *1032
elements in, *1033
by groups, ab 980
Deficiency
ascorbic acid and adrenocortical function, ab 160
essential fatty acids, ab 155, ab 280
in infants, ab 155
iron, ab 164
linoleic acid, ab 384
and liver disease, ab 966
malabsorption syndrome, ab 1082
nutritional
in mental illness, ab 496
role in cancer? ab 836
pantothenic acid, ab 1294
protein
and calories in world, *441
in South Africa, ab 594
thiamine and erythrocyte metabolism, ab 276
tocopherol in man, ab 1295
in tropical, preschool children, ab 502
vitamin
A, in world, *444
B, ab 155
Dehydrated foods
apples, ab 174
red, sour, pitted cherries, ab 161
Dehydration, developments in, *231
Delegation of duties, ab 286
Demand feeding, ab 54
Demonstrations, food, mobile, in Japan, f 820
Deodorants, possible effect on breast milk, ab 53
Department of Agriculture
meat acceptance service, nn 1210
poultry and egg acceptance service, nn 520
Depression, in pernicious anemia, ab 504
Dermatitis, from celery, ab 382
Desserts for aged, ab 394
Detergents, acid, for cleaning, ab 1302
Diabetes
adapting diets to patients, ab 730
alloxan, and diet, ab 1297
biguanide compound DBI in, ab 836
blood changes after glucuronic acid, ab 980
and cholesterol, ab 58
chlorpropamide in, ab 1291, ab 1296
cookbook for patients, br 1070
dietary fats in, ab 1296
dietary management of, ab 156
diuresis due to insulin, ab 726
employability with, ab 504
fat absorption and pancreatic function in, ab 49
formamidinyliminourea, evaluation of, ab 596
gastric secretion in, ab 1184
glucose
and blood ATP, ab 58, ab 58
plasma, turnover, ab 836
tolerance and glucosuria in, ab 598
utilization in, ab 598

insulin
dosage
and carbohydrate metabolism, ab 490
and diet, ab 838
equivalence of salicylate, ab 720
resistance, chronic, ab 724
metabolic defect in, ab 966
of long duration, ab 1296
among Natal Indians, ab 496
neuropathy of, ab 49
and tolbutamide, ab 724
obesity, ab 48
treating, ab 272
optic neuritis in uncontrolled, ab 1291
oral hypoglycemic agents, ab 159
plasma lipids and linoleic acid intake in, ab 838
in pregnancy, ab 728
regulating, ab 504
remittent insulin-insensitive, ab 270
and retinal hemorrhage, ab 276
retinopathy, and vitamin $B_{12}$, ab 842
subthreshold, ab 1184, ab 1296
surgery with, ab 504
teaching meal planning to student nurses, ab 156
treatment with tolbutamine, ab 724, ab 968
unstable, and insulin lipodystrophy, ab 270
Diarrhea
in jails in India, ab 500
peanuts, boiled, for, ab 606
Diet manuals, development of, ab 388
Diet therapy
in celiac disease, ab 164
history of, *1158
syndrome, ab 1186
in diabetes, ab 156
effect of beverages on gastric secretions after gastric resection, f 950
in heart disease, book review, br 154
high-fat in semistarvation, ab 608
for hypercholesteremia, ab 498
after intestinal resection, ab 382
in liver disease, ab 156
low-sodium diets, ab 162
bananas as staple in, ab 165
in peptic ulcer, ab 974
postoperative, *17, ab 382, f 950
and skin disease, *923
weight control, problem of, f 22
Dietary record technique, ab 730
Dietary surveys
calcium in urban diets, *1283
comparison of, *672
the interview, *677
record technique, ab 730
Dietetic foods, terminology for, f 256
Dietetics
in Australia, f 801
in Ceylon, l 860
in Germany, ab 386
in Great Britain, ab 56
human side of, *1048
in the Netherlands, ab 56
in Newfoundland, f 1036
in New Zealand, f 33
and psychiatry, ab 386
Dietitians
administrative, and decision-making, *1032
and chaplain can cooperate, cc 821
definition of, f 118
functions of, f 30
in Great Britain, ab 56
hidden characteristics of work, ed 1055
hospital
in rehabilitation program, cc 710
status of, *1027
as interpreters, f 226
need help from administrators, f 676
on nursing faculty, *1052
opportunities abroad, *447
part-time, f 922
professional responsibilities, test for, f 1057
public relations role in hospital, f 370
shared, work of, cc 956
in supermarkets, cc 151
Dining rooms for ambulatory patients, ab 1084
Discipline, employee, error-correction interview, ab 1300
Discussion
developing skills in, ab 1297
in problem-solving, ab 60
Dishwashing
of china, ab 614
compounds for, ab 738
developments, ab 852
economy with proper equipment, ab 1094
by electromation, ab 614
of glassware, ab 292
in cold water, nn 1328
hand, ab 1304
machine solves labor problem, ab 616
procedures, 1300
sanitation, ab 166
survey, ab 614
Diuresis due to insulin, ab 726
Doilies, paper, for attractive table service, ab 982
Dream Whip, additive in, ab 1082
Dubois Scholarships for dietetic interns, nn 514
Dumas, J. B. A., biographical note, f 750
Dumping syndrome, ab 600
Dysentery
in jails in India, ab 500
water-borne, ab 378

E

*E. Coli* and gastroenteritis in Calcutta, ab 378
Economic status and vitamins in human milk, ab 386
Education
continuing, *186, *268, *372, *486, *718
A.D.A. program, *66
dietetic
graduate program at Univ. of Kansas Medical Center, f 560
interns, case study in, *338, *343
food preparation, manual on, nn 192
home economics
in India, *453
in Iraq, *449
nursing
and the dietitian, f 934
dietitians on faculty for, *1052
philosophy of, f 962
teachers' problems and progress, *797
Eggs
Acceptance Service of USDA, nn 520
amino acids
availability in, ab 726
content of, ab 976
endrin in, ab 1078
frozen, ab 614
grading
by microwaves, ab 496
new USDA plan, ab 1102
intake and blood coagulation, ab 608
-milk mixtures, combined with oil, f 121
protein migration in, ab 382
-salad sandwich filling, bacterial growth in, *131
whites, whipping, and salt, ab 600
whole, biologic value of, *931
yolk, nutritional aspects of, ab 388
Electricity, food service equipment for, booklet, nn 1115
Electrolyte exchanges in obesity, ab 598
Electronic cooking, ab 286, ab 506
in hospital, cc 257, cc 260, ab 618
of pork, *1260
research in, ab 976
Eliot, Dr. M., honored, nn 74
Emotions
connected with food, *1048
and energy expenditures, ab 502, ab 606
in group feeding of aged, *938
in obesity, ab 834
saliva secretion indicates condition of, ab 1072
Employees (see also Personnel relations)
rating, ab 180
student, in college food service, cc 364
Emulsifiers, booklet evaluating, nn 754
Endrin in eggs and poultry, ab 1078
Energy
expenditures and emotions, ab 502, ab 606
measurements in man, ab 598
metabolism, research in, *682
needs influence home design for storage, ab 606
production, on high- and low-fat intakes, ab 976
surface area and body weight in studying, ab 598
Enrichment of rice with riboflavin, ab 161
Enteric infections in Alaska, ab 159
Environment and atherosclerosis, ab 378
Enzymes in protein malnutrition, ab 974
Equipment
air conditioners, ab 988
cantilevered, ab 508
cleaning, ab 1302
color in, ab 616
electrical, booklet on, nn 1115
gas-fired, ab 848
long-term leasing of, ab 1092
mobile, in hospitals, ab 1304
oven, new type, ab 986
pot and pan washers, ab 64
potato peelers, comparison of, ab 838
purchasing of, f 568
for quick service, ab 734
refrigeration, standards for, nn 406
replacement plan, ab 1300
research on, *551
for safer food service, ab 294
scales, ab 854
selecting for use with meat, ab 986
small, value of, ab 738
specifications for, ab 618, ab 1298
writing, ab 858
Erythorbic acid, ab 840
Erythrocyte metabolism and thiamine deficiency, ab 276
Esophageal stenosis, ab 968
Essential hyperlipemia, ab 378
Estrogens and nitrogen retention, ab 1293
Executives
position descriptions for, ab 1300
training of, ab 616
Exercise
blood lipids in, ab 976
food intake in mountaineering, ab 598
and serum cholesterol, ab 594
Exhibits, health, U.S., f 796
Eyes, neuritis in uncontrolled diabetes, ab 1291

F

Fabrics for uniforms, ab 48
Fads, booklet on combating, nn 992
Fallout
on foods, materials to protect from, nn 990
in milk, f 448, ab 596
strontium
in bone tissue, ab 500
in man, ab 844
in milk, f 448, ab 596
Fat
absorption in aged, ab 1293
adolescence, changes in, ab 980
in breakfasts, effect on stomach-emptying, ab 161
body
and cholesterol, ab 376, ab 376
determination of, ab 276
estimating by roentgenograms, ab 166
in diabetes, ab 1296
dietary
and glucose tolerance, ab 270
and growth, ab 280
in Hawaii, *122
high intake in semistarvation, ab 608
and nitrogen balance and heat production, ab 976
in older women, *935
and serum lipids, ab 376, ab 386
and serum triglycerides, ab 1294
filtration in food preparation, ab 984
intravenous emulsion, ab 376, ab 504, ab 1088
labeled, for diagnosis, ab 492
metabolism of, ab 49, *109, f 805
after pancreatectomy, ab 492
and pancreatic function in diabetes, ab 49
in pancreatitis, ab 1078
and pork quality, ab 722, nn 996
Fats
absorption in diabetes, ab 49
blood (see also Lipids)
coagulation and intake, ab 159
during exercise, ab 976
lowering of, ab 274, ab 974
patterns in heart disease, ab 49
and vegetable fat, ab 376
cooking, choosing of, ab 1090
composition of, f 1047
effect of mixed, ab 376
glycerides of, fatty acids in, ab 53
smoke point of, ab 278
soya oil and cholesteremia, ab 382
and tuberculosis in mice, ab 163
value as foods, ab 380
vegetable, effect on serum lipids, ab 376
Fatty acids
essential
and atherosclerosis, ab 155
deficiency, ab 54, ab 280
ratio to saturated in, ab 842
in rats, ab 155
in foods
supplements, ab 722
table on, nn 516
gas chromatography to analyze, ab 1296
in glycerides of fats, ab 53
and growth hormone, ab 724
in human milk, ab 606
in human nutrition, ab 155

metabolism of, ab 276
plasma, postoperative levels of, ab 974
polyunsaturated
cooking with fats high in, *119
lower serum cholesterol, ab 1186
and smoke point of fats, ab 278
unsaturated
in acne, ab 968
in adults, ab 286
and blood cholesterol, ab 52, ab 1072
booklet on, nn 208
effect on serum lipids, ab 974
in infants, ab 286
Fetus and maternal nutrition, ab 162
Fiji, nutritionist's work on, cc 951
Fire prevention for restaurants, ab 62, ab 1300
Fish
antibiotics preserve freshness, f 555
breaded frozen portions, ab 1204
folder on, nn 626
film on outdoor cookery, nn 518
flour, new plant in Sweden, nn 756
preparation of, ab 170, ab 1204, ab 1304
quality standards for, nn 520
salmon, composition after storage, ab 722
shark and skate, amino acids in, ab 1072, ab 1072, ab 1072, ab 1072
smoked, sorbate solutions to extend shelf-life, ab 1194
sodium and potassium in salt-water, *1163
Flavor
acceptance of strange foods, ab 970
adding to food, *227
Floors
guide for cleaning, ab 168
maintenance equipment, ab 856
plans, graphic aids in preparing, ab 168
in restaurants, ab 398
Flour, amino acids in, f 1051
Fluorides
and caries, ab 504, ab 730
deposition with low doses, ab 728
stannous, and teeth, ab 282
"Fog Index" for writing, *1038
Foil cookery vs. conventional roasting, *1255
Foliar nutrition for plants, f 1164
Folic acid
deficiency, excretion of formiminoglutamic acid, ab 1184
in megaloblastic anemias, ab 1184
in pernicious anemia, ab 384
Food, emotional factors in eating, *1048
Food and Agricultural Organization publications
Joint FAO/WHO Expert Committee on Nutrition—Fifth Report, nn 406
Milk and Milk Products in Human Nutrition, published, nn 1312
Report of the Fourth Conference on Nutrition Problems in Latin America, nn 518
Report of the Regional Seminar on School Feeding in South America—Bogota (Colombia), 27 October-8 November 1958, nn 1104
Report of the FAO/UNICEF Regional School Feeding Seminar for Asia and the Far East—Tokyo, Japan, 10-19 November 1958, nn 992
Food composition
of Army food, *462
calcium in 95 foods, *1170
of carob, ab 600
of irradiated foods, *237
magnesium in 95 foods, *1170
phosphorus in 95 foods, *1170
potassium in 95 foods, *1170
sodium
in 95 foods, *1170
in Puerto Rican foods and waters, *1165
in salt-water fish, *1163
Food habits
American, past and present, ab 376
changing
psychology in, ab 49
through "tasting table," f 264
of Puerto Ricans, ab 834
in South Pacific, cc 951
in Southwest, ab 594
in U.S., ab 376
wine usage, ab 51
of women, ab 382
Food industry, a business barometer, f 342
Food misinformation, booklet on combating, nn 992
Food and Nutrition Board publications
Food-Packaging Materials — Their Composition and Uses, nn 754
Safety of Polyoxyethylene (8) Stearate for Use in Foods, The, nn 754
Food poisoning
bacteria in potato and turkey salad, *38
botulism, ab 1297
from codfish, ab 612
from insecticide leakage, ab 163
from vending machines, ab 56
Food preparation (see Cookery)
Food restriction, effect on cholesterol metabolism, *115
Food service
by contract, in colleges, ab 1298, ab 1298
manager, ab 58
mobile, systems for, ab 1092
supervisors, Kellogg Foundation Grant to A.D.A. to develop course for, 1063
workers, training course for, published, nn 994
Food supplies in retail stores, nn 198
Formamidinyliminourea, oral blood sugar-lowering compound, ab 596
Formiminoglutamic acid, excretion in folic acid deficiency, ab 1184
Frankfurters
simulated, soybean protein for, ab 970
surface flora on, ab 970
Freeze-drying
of foods, ab 982
of meat, ab 496
Fridays, menu problems in school lunch, ab 1298
Frozen foods
apples compared with fresh and canned, f 1289
for babies, ab 1294
beef, color in prepackaged, ab 274
blueberries, nn 996
cakes, ab 498
chicken
palatability, bacteria in, and thiamine, ab 972
pies, microflora in, ab 970
compared with fresh, ab 1090, ab 1202, ab 1202
defrosting ultrasonically, ab 498
determining quality, nn 200
developments in, *231
eggs, ab 614
green beans compared with fresh and canned, *1270
ham loaf, bacteria in, palatability, and thiamine, ab 972
home freezing, ab 1292
Italian rice, bacteria in, palatability, and thiamine, ab 972
leaflets on, nn 518
meat, ground, effect of packaging on, ab 600
peas, storage of, nn 998
pork, effect of tocopherol in swine rations, ab 970
sweet potatoes, sliced and precooked, ab 1194
time-temperature tolerance in, *128
chicken, ab 722
use in Northeast, nn 756
Fruit
canned, artificially sweetened, standards for, nn 626
dried
in food service, ab 390
using, ab 64
fresh, purchasing, ab 390
insecticide
flavor changes caused by, ab 972
residues in, ab 274
in menu planning, ab 1306
preservation of, ab 838
and serotonin and catechol amines, ab 836
serving with flair, ab 392
storage of, ab 392
Fry cooks, training of, ab 60
Fungi, food spoilage, and antibiotics, ab 498


## G


Gallbladder disease, ab 496
Garlic and intestinal microflora, ab 159
Gas
chromotography, ab 1090, ab 1296
-fired equipment, ab 848
fuel, ab 737
Gastrectomy
androgenic hormone after, ab 840
carbohydrate metabolism after, ab 836
dumping syndrome after, ab 600
effect of beverages on gastric secretions after, f 950
iron absorption after, ab 972
steatorrhea after, ab 595
subtotal, adjustment after, ab 1184
vitamin $B_{12}$ absorption after, ab 500
Gastric acid, inhibition of, ab 1078
Gastric juice
in diabetes, ab 1184
and coffee intake, ab 1184
proteins in, ab 838
Gastroenteritis
in Calcutta in summer, ab 378
from turkeys, ab 1200
Gastrointestinal changes in malnutrition, ab 1082
Gastrointestinal function
and potassium, *490
after surgery, *17
Germany, dietetics in, ab 386
Ghana, nutritionists' opportunities in, ab 1086
Ghee, ab 1296
Glassware, washing of, ab 292
Globulin, serum levels, ab 978
Glucose
assimilation with Orinase, ab 1074
blood, and liver, ab 490
in diabetes, ab 58
and lipids, relationship, ab 966
plasma, turnover, ab 836
tolerance
and dietary fats, ab 270
impaired, and glucosuria, ab 598
utilization
in diabetes, ab 598
and growth hormone, ab 160
Glucose-6-phosphatase in pregnancy, ab 378
Glucosuria and impaired glucose tolerance, ab 598
Glucuronic acid, blood changes after, in diabetes, ab 980
Glutathione metabolism in newborn, ab 163
Gluten
diet in celiac disease, ab 164
effect of radiation on, ab 490
Glycerides
of fats, fatty acids in, ab 53
postoperative levels of, ab 974
Glycogen in human liver, ab 976
Glycosides, goitrogenic action of, ab 280
Goiter
caused by glycosides, ab 280
endemic, ab 380
world problem, *445
iodine and vitamin A in, ab 1200
and vitamin A, ab 278
Government publications
Beltsville Kitchen-Workroom with Energy-Saving Features, The, nn 194
Buying Practices and Food Use of Employee Food Services in Manufacturing Plants, nn 868
Consumer Preferences, Usages, and Buying Practices for Poultry and Poultry Products, nn 194
Diet, Hormones, and Atherosclerosis, nn 754
Eat a Good Breakfast to Start a Good Day, nn 754
Employee Food Services in Manufacturing Plants—Management Appraisals, Nature and Extent, Vending Machines, nn 868
Family Purchases of Selected Frozen Fruits and Vegetables, nn 756, nn 870
Farm-to-Retail Price Spreads for Cheddar Cheese in the South, nn 757
Fatty Acids in Food Fats, nn 516
Food Guide for Older Folks, nn 868
Home Economist in Civil Defense, The, nn 78
Homemaker Services in the United States, 1958—A Nationwide Study, nn 404
Homemaker Services in the United States, 1958—Twelve Descriptive Statements, nn 404
How to Buy Poultry by USDA Grades, nn 1312
Institutional Meat Purchase Specifications, nn 1210
Making and Preserving Apple Cider, nn 78
Navy submarine recipes, nn 302
Nutrition and Food Service in Nursing Homes and Homes for the Aged, nn 194
Operation Plumbbob, WT-1496 and WT-1497, nn 990
Policies and Practices of Some Leading Institutional Wholesale Grocers, nn 1312
Pork in Your Meals, nn 1312
Poultry Availability and Merchandising in Retail Stores, nn 76
Poultry Hygiene. Part 1. Examination and Evaluation of Poultry and Poultry Products, nn 1212
Program Guide on Beef, nn 872
Quantity Food Preparation—A Curriculum Guide, nn 192
Shopper's Guide to U.S. Grades of Food, nn 76
for supervisors, list, nn 1106
Tips on Cooking Fish and Shellfish, nn 626
Training for Quantity Food Preparation, nn 192
Turkey on the Table the Year Round, nn 302
USDA Grade Marks and the Foods on Which They Are Used, nn 302
Work Injuries and Work-Injury Rates in

Hospitals, f 681
Grades, food
of eggs, new designation, nn 1102
government pamphlets, nn 76, nn 302
of lamb and mutton changed, nn 1312
leaflet on, nn 302
Graduate education, need for, cc 1065
Great Britain (see also London)
food consumption for 1957 report published, nn 1314
*Manual of Nutrition* published, nn 994
sanitary regulations in, ab 836
social dietitian in, ab 56
soft drink regulations, ab 840
Grievances, employee, handling, *1041
Groceries, food supplies in, nn 198
Group (see also Discussion)
-decision, *186
dynamics, decision-making in, ab 980
feeding, ab 610, ab 610
for aged, *938
process, value of, ab 1297
Growth
and fat intake, ab 280
of Guatemalan children, ab 594
hormone
and fatty acids, ab 724
and glucose utilization, ab 160
patterns of Ohio children, *457
Guacamole, frozen, nn 80
Gulf Coast, sodium in salt-water fish of, *1163

H

Haiti
atherosclerosis compared with South Carolina, *919
diets compared with South Carolina, *910
heart disease in Negroes, ab 848
Ham
cooking in foil, *1255
loaf, frozen, palatability, bacteria in, and thiamine, ab 972
salad, sandwich filling, bacterial growth in, *131
salt accumulation during curing, ab 1186
Hamburgers, preparing good, ab 614
Handicapped, energy-saving kitchen for, bulletin, nn 194
Hawaii, diets in, *122
Heart disease
anti-coronary club, ab 1186
in Bantu, ab 834
dietary prevention and treatment, br 154
etiology, factors in, ab 1294
lipid patterns in, ab 49
and lipoproteins, ab 978
in Negro, ab 1084
in Haiti and South Carolina, ab 848, *910
research opportunities abroad, *671
serum cholesterol, in, ab 1198
triglycerides, serum, in, ab 492
Heat, climatic, and serum ascorbic acid, ab 842
Heat transfer in white sauce cooled by flowing water, *1275
Heinz International Symposium on Nutrition, ab 1292
Height and weight, new insurance data, f 1254
Hematology, ab 380
Heredity and atherosclerosis, ab 378
Herring-meal protein, utilization of, ab 968
Heterocycles and pteridines, ab 1184
*History of The American Dietetic Association*, 1058
History of nutrition
Arataeus, biographical note, f 234
calorimetry, ab 492
celiac disease, *1158
Chevruel, M. E., biographical note, f 792
Dumas, J. B. A., biographical note, f 750
Holst, A., biographical note, f 918
Lancaster, Sir James, biographical note, f 72
Mattill, H. A., biographical note, f 1172
Muffett, T., biographical note, f 337
Nascher, I. L., biographical note, f 577
Pepys, S., biographical note, f 190
rickets research, early, *806
Roberts, L. J., Essay Award, rules of, ed 948
Scheele, C. W., biographical note, f 1308
Sherman, H. C., biographical note, f 1100
silver tableware, cc 582
smorgasbord, origin of, f 127
soybean in history, f 249
vegetables in infant feeding, *692
Young, J. R., biographical note, f 461
Holst, A., biographical note, f 918
Home-care for invalids, ab 608
Home design influenced by energy need, ab 606
Home economics
in India, *453
in Iraq, *449
objectives of education in, f 1064
situation of profession, cc 1065
Home economist
and civil defense, booklet, nn 78
contribution to research, ab 976
Homemaker
handicapped, program for, cc 711
services
booklets on, nn 404
conference on, nn 404
Homes for aged, food service manuals for, nn 870
Honey in infant feeding, ab 386
Hookworm
infection, iron reabsorption in, ab 1082
iron and, research needed, *670
Hormones, interrelationships with amino acids, *929
Hospital food service
budgeting for, cc 1173
building good will through, ab 62
centralized, ab 616
check sheet for evaluating, *560
for children, ab 850
dining rooms for ambulatory patients, f 1054
electronic cooking in, cc 257, cc 260
food distribution techniques, ab 62
gourmet touches in, ab 1204
injuries in, f 681
paper table ware in, cc 260
with progressive patient care, f 943
transportation of food, *556
who should head? f 1068
wine in, f 363, l 858
Hospitals
accreditation in Canada, nn 516
dietitians
public relations role in, f 370
status in, *1027
need for more facilities, f 831
statistics for 1957, f 1040
Housekeeping and dietary functions can mesh, ab 62
Human relations in administration, *333
Hunger and appetite, ab 48
Hypercholesteremia
alcohol and magnesium in, ab 608
dietary management of, ab 498
Hyperglycemia and obesity in mice, ab 596
Hyperlipemia, familial, ab 730
Hypertension
development, and sodium intake, ab 976
effect of chlorothiazide on, ab 166
essential, acid-base balance in, ab 726
in Negroes, ab 720
salt and, ab 270
intake, f 130
metabolism in, ab 492
Hypnosis and reducing, ab 728
Hypocholesteremia
due to brain extract, ab 163
niacin, ab 1294
Hypoglycemia
agents, oral, ab 159
in flight, ab 840
and phenylketonuria, ab 978
from tobacco smoke, ab 968

I

Ice cream, strawberry, consumer preferences for, ab 498
Idiopathic hypercalcuria, ab 165
India
diarrhea, dysentery, and colitis in jails, ab 500
ghee in, ab 1296
malnutrition
in Punjab, ab 165
in South India, ab 1200
metabolism on poor vegetarian diet, ab 1072
multipurpose food in, ab 1291
nutritional status of industrial workers, ab 386
teaching home economics in, *453
Indians
American
cholesterol in, ab 844
medical practice on reservations, ab 280
nutrition program for, *905
Pima, diseases in, ab 1196
Natal, diabetes among, ab 496
Indigestion, ab 156
Industrial feeding, government survey of, ab 984, nn 868
Industrial workers
with diabetes, ab 504
food intake of, ab 598
nutrition of, ab 386, ab 848
women, feeding of, ab 610
Infants
anemia in, ab 50
breast feeding, ab 54, ab 54, ab 834, ab 978
celiac disease, history of, *1158
cow's milk formula, ab 500
demand feeding, ab 54
dietary diseases in, ab 1086
fatty acids, ab 155, ab 280
feeding practices in Australia, ab 1292
frozen foods for, ab 1294
glutathione metabolism in, ab 163
history of use of vegetables for, *692
honey in feeding, ab 386
iron metabolism in, ab 842
linoleic acid requirement of, f 1142
lysine as supplement for, ab 978
marasmus in, *443
nutrition of, ab 276
overnutrition in, ab 1198
premature, lactic acid milk for, ab 978
protein
allowances for, ab 842
need of, ab 842
scurvy in, ab 163, ab 970
size at birth, ab 165, ab 378
Infarction, myocardial
and nutrition, ab 376
and serum lipids, ab 500
Infectious hepatitis, ab 720
Infection
in kwashiorkor, ab 164
and nutrition, ab 596
Insect and rodent control, ab 1302
Insecticides
endrin in eggs and poultry, ab 1078
on fruits, ab 274, ab 972
and human nutrition, ab 56
leakage as cause of food poisoning, ab 163
Insulin
and carbohydrate utilization, ab 490
chronic resistance to, ab 724
diuretic effect of, ab 726
dosage and diet, ab 838
equivalence of salicylate, ab 720
-insensitive diabetes, ab 270
intestinal absorption of, ab 1074
lipodystrophy and unstable diabetes, ab 270
Insurance needs for a restaurant, ab 1302
International Congress of Dietetics, Third, 1961, nn 862, nn 1208
International Congress on Nutrition, Fifth, nn 752
International nutrition, opportunities for research, *441, *669
Interns, dietetic, case study in educating, *338, *343
Interviews
personal counseling, ab 178, ab 1300
psychology of, ab 290
techniques of, *677
Intestinal infection, in Alaska, ab 504
Intestinal resection, nutrition after, ab 382
Intestines, function of vitamin A in, f 937
Intrinsic factor
distribution of activity, ab 48
oral, failure in pernicious anemia, ab 1291
Iodine
in goiter, ab 1200
intake, variations in, ab 974
Iraq, teaching home economics in, *449
Iron
absorption after partial gastrectomy, ab 972
deficiency, ab 164
anemia, treating, ab 386
exchange in man, ab 606
and hookworm, research needed, *670
metabolism, ab 282, ab 610
in infants, ab 842
oral, in hypochromic anemia, ab 278
reabsorption in hookworm infection, ab 1082
Irradiation
chicken meat, storage of, ab 1076
effect
on carotenoids in vegetables, ab 1076
on green beans and broccoli, ab 1076
on Lima beans, ab 1084
on peas, ab 1084
pork sausage, storage of, ab 1076
scallops, storage of, ab 1076
sweet potatoes, storage of, ab 1076
Isotopes, in drinking water, ab 974
Italian rice, frozen, palatability, bacteria in, and thiamine, ab 972

J

Jails, diarrhea, dysentery, and colitis in India, ab 500
Japan
mobile food demonstrations in, f 820
nutrition in, nn 408
Jaundice, labeled fat in diagnosis, ab 492
Jews, kosher kitchen in hospital, ab 842

Job descriptions for executives, ab 1300
Johnson, D., President, American Dietetic Assn., ed 945
*Journal of Nutrition* appoints new editor, nn 862

K

Kellogg Foundation Grant to A.D.A., 1063
Kidney
  disease, urinary osmolality, ab 724
  magnesium excretion, ab 162
  vitamin $B_{12}$ in, ab 726
Kitchen planning, ab 734, ab 1092
  an architect evaluates, *556
Knees, development in kwashiorkor, ab 502
Korean soldiers, nutrition of, ab 1084
Kosher kitchen in hospital, ab 842
Krk, Island of, goiter on, ab 1200
Kwashiorkor, *441
  anemia in, ab 602
  and bacterial infection, ab 164
  and knee development, ab 502
  in South India, ab 1200
  in tropical, preschool children, ab 502
  and vitamin A absorption, ab 594

L

Labor costs, new equipment saves, ab 168
Labor relations (see also Personnel relations)
  bargaining guide, ab 58
  grievance handling, *1041
Lactic acid
  bacilli in cow's milk, ab 52
  milk for premature infants, ab 978
Lactose
  adaptation to, ab 610
  and calcium utilization, ab 1295
  effect on calcium and strontium absorption, ab 1084
Lamb
  accompaniments, ab 618
  grades changed, nn 1312
  grading may be ended, nn 872
Lancaster, Sir James, biographical note on, ab 72
Lathyrism vs. odoratism, ab 502
Layouts, planning, scale models in, ab 290
Lead
  in foods, ab 165
  poisoning, ab 282, ab 500
Leadership, ab 284
  cultural barriers to, ab 388
  personality for, *718
Lecithin, ab 52
Lemon juice, drinking discouraged, ab 1078
Leukemia
  in pregnancy, ab 490
  riboflavin activity in, ab 976
Librarians, periodicals for, l 858
Libraries, dietitians cooperate with, l 512
Light, effect on milk, ab 274
Lighting in restaurants, ab 180
Lime, effect on nutrients in corn, ab 51, ab 51
Linoleic acid
  and caloric intake, ab 384
  deficiency, ab 384
  dietary and plasma lipids, ab 155, ab 838
  effect on serum cholesterol in rabbits, ab 974
  in infants
    requirement, f 1142
    and skin diseases, ab 155
Lipids
  blood
    during exercise, ab 976
    lowering, ab 274
  and glucose, relationship, ab 966
  levels in diseases, ab 608
  metabolism
    in aged, ab 974
    in surgery, ab 966
  phospho-, postoperative levels of, ab 974
  plasma, and dietary linoleic acid, ab 838
  serum
    in aged, ab 490
    and atherosclerosis, ab 840
    and dietary fat, ab 386
    effect of unsaturated fatty acids in aged, ab 974
    effect of vegetable oils on, ab 376
    and myocardial infarction, ab 500
    in pregnancy, ab 720
  in skin disease, *924
  after surgery, ab 720
Lipogenesis in obese mice, ab 834
Lipoproteins and myocardial infarction, ab 978
Liver
  and blood glucose, ab 490
  damage, vitamin $B_{12}$ as index to, ab 1291
  effect of alcohol on, ab 1082
  effect of food intake and growth hormone on, ab 598
  fatty cholesterol, effect of cold environment on, ab 1084
  function
    tests in amebiosis, ab 1295
    and vitamin $B_{12}$, ab 600
  glycogen levels in humans, ab 976
  vitamin $B_{12}$ in, ab 726
Liver disease
  blood amylase level in, ab 1291
  caused by poor vegetarian and rice diet, ab 1074
  cirrhosis, serum proteins in, ab 52
  diet therapy for, ab 156
  infectious hepatitis, ab 720
  and malnutrition, ab 966
  vitamin K in, ab 720
  zinc metabolism in, ab 968
Loan Fund of A.D.A., ed 947
Loggers, nutrition surveys of, ab 1294
London, children's teeth in, ab 270
Longevity in Western world, statistics, f 1162
Lufkin, P. E., receives L. J. Roberts Essay Award, 1062
Lysine
  in biscuits, *469
  as dietary supplement for infants, ab 978
  limiting amino acid in wheat gluten, ab 1295
  protein levels in fortified flour, ab 728

M

Magnesium
  depletion, ab 492
  in hypercholesteremia, ab 608
  in 95 foods, *1170
  and renal excretion, ab 162
  serum, in disease states, ab 166
Maintenance
  cleaning compounds, ab 398
  floors, ab 168
  preventive, for equipment and utilities, *56
Malformation, congenital, ab 274
Malignancy, serotonin-tryptophan metabolism, ab 1184
Malnutrition (see Deficiency and Kwashiorkor)
Management, basic processes in, ab 1298
Managers, training, ab 1302
Manganese metabolism, ab 53
Maple sirup urine disease, ab 380
Marasmus, a world deficiency problem, *443
Mattill, H. A., biographical note, f 1172
McAuley, M. F., Memorial Loan Fund, ed 947
Mead Johnson Awards
  for graduate study and for dietetic interns, recipients announced, 1063
  rules of, ed 948
Meat
  achieving holiday flavor in, ab 170
  Acronizing methods for, ab 1293
  antibiotic
    residues in, ab 1293
    -treated, irradiation of, ab 160
  beef
    color in frozen prepackaged, ab 274
    irradiated and vitamin K deficiency, ab 1295
    preference studies, ab 972, ab 1293
    roasts, effect of size and internal temperature on cooking, *569
  canned comminuted, shelf-life of, ab 51
  cookery, ab 1300
    foil vs. conventional roasting, *1255
  cutting to save costs, ab 1096
  flavor, ab 272
  freeze-dried, ab 496
  frozen ground, effect of packaging on, ab 600
  inspection, world standards for, ab 730
  irradiated
    acceptability of, ab 272
    storing, ab 161
  on menu, ab 852
  pork
    cooking electronically, *1260
    effect of fatness on, ab 722
    irradiated, oxidative changes in, ab 274
  prepackaged, bacteria in, ab 272
  preserving effect of salt, ab 1292
  slicing for profit, ab 852
  specifications released by USDA, nn 1210
  substitute, simulated frankfurter and bologna, ab 970
  tenderization, ab 50, ab 50
  vitamin $B_6$ retention in, ab 726
Mental illness, nutritional deficiencies in, ab 496
Menus
  for Fridays in school lunch, ab 1298
  nutritional value of patient-selected, ab 170
  planning
    for children, ab 184
    use of fruit in, ab 1306
Microbiology
  of potato and turkey salads, *38
  of protein sandwich fillings, *131
Microflora, intestinal, and garlic, ab 159
Microwave cooking (see Electronic cooking)
Microwaves in grading eggs, ab 496
Milk
  amino acid availability in, ab 726
  calcium utilization from, ab 52
  carrier for streptococcal sore-throat, ab 608
  concentrated, sterilized, f 703
  consumption, nn 872
  cow's
    antibiotics in, f 1157, ab 1294
    biologic value of protein, *931
    formula, ab 500
    lactic acid bacilli in, ab 52
    protein in, ab 976
  dry, use in hospital food service, ab 390
  effect of light on, ab 274
  fallout effect on, ab 596
  fortified with ascorbic acid, ab 724
  homogenized, f 482
  human
    fatty acids in, ab 606
    protein in, ab 976, ab 1078
    vitamin content and economic status, ab 386
  lactic acid, for premature infants, ab 978
  nonfat dry
    bread recipes using, cc 1178
    whey, nn 1316
  preferences studied, nn 998
  radiation of, ab 838
  radioactivity of, ab 166, nn 198, f 448
  strontium-90 in, f 448
    method to remove studied, nn 1328
  use by aged, booklet, nn 192
  yoghurt, value of, ab 1082
Miller, C., honored, nn 192
Minerals
  in human bone, ab 162
  metabolism research in, *112
  in vegetables, ab 1293
Mixes
  for bakery use, ab 288
  baking, ab 856
  cake vs. conventional, f 581
Mobile food service, cc 146, cc 149, ab 618, ab 840, l 858
Mobility of equipment, ab 172
Mongoloids, pyridoxine excretion in, ab 376
Moore, M. C., honored, nn 514
Mortality statistics for Western world, f 1162
Motivation, *372, *486
Mountaineering, food intake in, ab 598
Muffett, T., biographical note, f 337
Museums, health, in U.S., f 796
Mushrooms
  amino acids in, ab 161
  poisonous, ab 1082
Multipurpose food in India, ab 1291
Mutton grading, nn 872, nn 1312
Myocardial infarction in Negro, ab 1084

N

Nascher, I. L., biographical note, f 577
Nausea in pregnancy, preventing, ab 490
Navy
  new white bread formula, nn 628
  nuclear submarine feeding, ab 506
Negroes
  clay and starch eating women, *810
  dietary study in South Carolina, *910
  heart disease in Haiti and South Carolina, ab 848
  hypertension in, ab 720
  myocardial infarction in, ab 1084
Netherlands, dietetics in, ab 56
Neuritis optic, and diabetes, ab 1291
Neuropathy, diabetic, ab 49
Newfoundland, dietetics in, f 1036
New Guinea, nutrition of children, ab 600
New Zealand, dietetics in, f 33
Niacin
  in coffee, ab 1074
  and serum cholesterol, ab 50, ab 1294
  and skin disease, *926
  to treat arthritis, ab 1291
  and tryptophan metabolism, ab 386
Nitrogen
  balance
    on high- and low-fat intake, ab 976
    and torula yeast supplements, ab 1295
  intake and riboflavin excretion, ab 1295
  metabolism and vitamin $B_{12}$, ab 606
  retention and estrogens and androgens, ab 1293
Nursing education
  the dietitian on faculty, *1052
  importance to dietitian, f 934
  teaching diabetic meal planning, ab 156
Nursing homes,
  bibliography on food service, nn 194
  guide suggests dietary consultant, f 1269
Nutrition
  advances in, *109
  and atherosclerosis, ab 376
  in space flight, *13

Nutrition education
for adolescents, ab 1304
course for aged, nn 300
in Japan, f 820
objectives of, f 691
and pupils' tastes, ab 60
teachers' preparation to teach, *802
Nutritional status of industrial workers in India, ab 386
Nutritional surveys
of armed forces in Pakistan, ab 1295
of loggers, ab 1294
of Korean soldiers, ab 1084
in Thailand, *1143, *1149
Nutritionists
in community health programs, *793
definition of, f 118
opportunities abroad, *447, *669
in Ghana, ab 1086
in Public Health Service in new category, nn 752
work in South Pacific, cc 951

O

Obesity, f 22, ab 380
adolescent, ab 49
psychologic aspects of, ab 49
in aged, ab 594
and cardiopulmonary function, ab 848
caused by tranquilizers, ab 168
in children, ab 52, ab 608
comparison of anorexigenic agents, ab 974
and diabetes, ab 48
in patients, ab 272
emotional aspects of, ab 56
etiology of, ab 382
with hyperglycemia in mice, ab 596
hypnosis and reducing, ab 728
juvenile, ab 730
liothyronine therapy for, ab 502
patient selection for reducing, ab 978
psychogenic theory of, ab 834
surgical complications in, ab 968
treatment of, f 468, ab 492
methods, ab 594
and vascular degeneration, ab 274
water and electrolyte exchange in, ab 598
weight gain after stopping smoking, ab 606
Odoratism vs. lathyrism, ab 502
Ohio, children's growth patterns, *457
Oil
composition of, f 1047
ways to combine with egg-milk mixtures, f 121
Optic neuritis and diabetes, ab 1291
Orange juice powder, ab 498
Orinase, effect on glucose assimilation, ab 1074
Ornithosis in man from turkeys, ab 156
Osmolality, urinary, ab 724
Osteoporosis in the aged, ab 498, ab 602
Oven, ab 296
new type, ab 986
Overnutrition in children, ab 1292
Oysters, cause of typhoid, ab 382

P

Packaging
of berries to preserve freshness, ab 51
cereals with antioxidant-treated chipboard, ab 160
effect on frozen ground meat, ab 600
flexible, for food, ab 980
materials, booklet, nn 754
of meat, bacteria counts in, ab 272
protection for foods from fallout, nn 990
Pakistan, nutrition of armed forces, ab 1295
Pancreas function in diabetes, ab 49
Pancreatectomy and fat metabolism, ab 492
Pancreatic fistula, ab 596
Pancreatitis
protein and fat metabolism in, ab 1078
serum amylase activity in, ab 1295
Pantothenic acid deficiency, ab 1294
Papain in meat tenderizers, ab 50
Paper products
in cafeteria operation, ab 1092
in hospital food service, cc 260
trend in tray covers, nn 518
Papua, nutrition of children, ab 600
Parathyroids and bone phosphorus, ab 1074
Patients
ambulatory, dining rooms for, f 1054, ab 1084
problem of noningesting, ab 1296
Patton, M. B., receives Borden Award, nn 862
Payroll cost analysis, ab 172
Peaches
canned cling, carotenoids in, ab 1074
freestone, consumer acceptance of, ab 1186
Peanut butter, amino acid availability in, ab 726
Peanuts
boiled, for diarrhea, ab 606
proteins in, ab 164
effect of heat on, ab 51
Peas
canned, irradiated, ab 496
amino acids in, ab 1084
frozen, storing, nn 998
Peelers, potato, comparison of, ab 838
Pellagra, world problem, *445
Pemmican for survival, ab 608
Penicillin residues in milk, ab 1294
Pentose metabolism and pentosuria, ab 966
Pepper, coarser normal grind, f 229
Pepys, S., biographical note, f 190
Personality, leader's, *718
Personnel relations, *333, ab 394
counseling
vs. criticizing, ab 48
interview, ab 178
employee rating, ab 180
employee selection, 6 steps in, ab 1298
employee turnover, problems of, *1043
error-correction interview, ab 1300
grievance handling, *1041
Perspiration and intestinal fat absorption, ab 844
Pesticides and flavor changes in produce, ab 972
Phenylalanine converted to tyrosine in phenylketonuria, ab 284
Phenylketonuria, ab 280, ab 282
co-factor converts phenylalanine to tyrosine, ab 284
and hypoglycemia, ab 978
Phosphorus
bone, and parathyroids, ab 1074
in diabetes, ab 58
in 95 foods, *1170
retention on low-calcium intake, *31
Phrynoderma, etiology of, ab 834
Pica in pregnant women, *810
Pituitary hormone, effect on cholesterol, ab 1074
Planning, kitchen, ab 390, ab 508
Plant extracts as possible cancer fighters, f 1274
Plants, foliar nutrition for, f 1164
Plastic tableware, guide for, ab 506
Pork
amino acid availability in, ab 726
cooking electronically, *1260
effect of fatness on, ab 722, nn 996
frozen, effect of tocopherol in swine rations, ab 970
irradiation causes oxidative changes, ab 274
sausage, irradiated, storage of, ab 1076
Pot and pan washing, ab 1304
machines, ab 64
Potassium
in bank blood, ab 388
body, and age, ab 1297
and gastrointestinal function, ab 490
metabolism after surgery, ab 724
in 95 foods, *1170
in pregnancy, ab 280
in Puerto Rican foods and waters, *1165
in salt-water fish, *1163
Potatoes
flavor of, ab 602
French fries
new shapes for, ab 58
pre-peeled, ab 1292
tips on, ab 737, ab 1298
granules, storage characteristics of, ab 161
irradiated, ab 50
new products, ab 614, ab 737
processing statistics, nn 408
salad, bacteria in, *38
Poultry
Acceptance Service of USDA, nn 520
broiler use in Tennessee, nn 304
coatings to extend shelf-life, ab 498
consumer preferences, report on, nn 194
endrin in, ab 1078
tenderness of, nn 80, ab 380, ab 380, ab 498
Preferences for strawberry ice cream, ab 498
Pregnancy
amino acid excretion in, ab 1200
changes in, ab 276
and diabetes, ab 728
diet in, ab 270, ab 968
food cravings and dislikes in, ab 272
glucose-6-phosphatase in, ab 378
leukemia in, ab 490
megaloblastic anemia of, ab 386
nausea, prevention of, ab 490
nutrition in, ab 276, ab 596
state prior to, ab 162
symposium reported, nn 990
pica during, *810
salt intake in, ab 382
serum lipids in, ab 720
sickle cell anemia in, ab 966
sodium and potassium in, ab 280
vitamin $B_6$ deficiency in, ab 1200
vitamin $B_{12}$ metabolism in, ab 378
Preservation, food
anti-oxidant treatment of cereal packages, ab 160
for Armed Forces, ab 720
developments in, *230
freeze-drying, ab 982
of meat, ab 496
of fruit, ab 838
by irradiation, ab 274, ab 612, ab 720, ab 1297
of antibiotic-treated meats, ab 160
of canned peas, ab 496
and *Cl. botulinum*, ab 496
of potatoes, ab 50
progress in, ab 728
wholesomeness of products, *235
of meat with salt, ab 1292
vitamin $K_5$ for, ab 50
Problem-solving, discussion in, ab 60
Produce
fresh, buying, ab 390
purchasing survey published, nn 870
Progressive patient care, dietary service in, f 943
Protein
absorption, ab 498
allowances for infants, ab 842
amino acids
in high-protein meal, ab 382
requirements, *929
supplementation, ab 48
bread, nutritive value of, ab 968
in breast milk, ab 1078
in coconut meal, ab 1072
corn
effect of radiation on, ab 498
supplemented with amino acids, ab 384
of cow's milk, ab 976
deficiency
in skin disease, *924
in world, *441
effect
on blood cholesterol, ab 722
of high and low, ab 49
in eggs, ab 382
in foods, evaluating, ab 606
in gastric juice, ab 838
in Hawaiian diets, *122
herring-meal, utilization of, ab 968
of human milk, ab 976
levels in lysine-fortified flour, ab 728
malnutrition
enzymatic factors in, ab 974
in South Africa, ab 594
in South India, ab 1200
metabolism
in aged, ab 1078
in pancreatitis, ab 1078
need in infants, ab 842
in peanuts, ab 164
effect of heat on, ab 51
of pumpkin, ab 1291
quality, evaluating for advertising, *574
requirements, ab 1198
research advances, *111
serum
in aged, ab 161, ab 490
in cirrhosis, ab 52
in different races, ab 844
electrophoretic pattern of, ab 278
in South Africa, ab 612
soybean for simulated frankfurter and bologna, ab 970
supplementary relationship of, *34
value of a vegetable mixture, ab 1297
Proximate values of Army food, *462
Psoriasis, diet in, ab 728, *927
Psychiatry and dietetics, ab 386
Pteridines and other heterocycles, ab 1184
Public health programs to fit changing needs, *789
Public Health Service, nutritionists in new category, nn 752
Public relations—dietitian's role in hospital, ab 62, ab 204, f 370
Puerto Rico
food habits in, ab 834
sodium and potassium in foods and waters of, *1165
Pumpkin, protein of, ab 1291
Purchasing
data file for, ab 856
equipment, specification writing for, f 568
food, ab 1306
motivations for, ab 1306
meat, specifications for, nn 1210
snap beans, ab 988
Pyridoxine excretion in mongoloids, ab 376
Pyrimidine metabolism in man, ab 974

Q

Q fever, ab 276
Queen Elizabeth's diet, f 114

R

Radiation
beef

raw, changes effected, ab 1292
vitamin K deficiency from, ab 1295
and browning reaction, ab 722
of canned peas, ab 496
and *Cl. botulinum*, ab 496
contamination of food, ab 610, ab 610
effect on amino acids, ab 1295
effect on corn protein and wheat gluten, ab 498
fallout, packaging protection for, nn 990
in food preservation, *232, ab 612, ab 720, ab 728, ab 1296
of meats, antibiotic-treated, ab 160
of milk and its products, ab 838
of pork causes oxidative changes, ab 274
of potatoes, ab 50
storing meat, ab 161
-treated foods, wholesomeness of, *235
of wheat, ab 1292
Radioactivity
of milk, ab 166, nn 198, f 448
soil contamination by strontium-90, ab 58
of vegetables in U.S., nn 1314
Radishes, buying, ab 620
Ragi, diet in India, children's metabolism on, ab 1072
Ranges, kitchen, ab 296
Recipe Magician, cc 45, 1 512
Recipes
calculating yields, cc 45
Navy's submarine compilation, nn 302
standardized, ab 390, *508, ab 618, ab 732, ab 1304
Recommended Dietary Allowances
and the food industry, ab 1186
in military feeding, ab 1186
Reducing (see also Obesity)
comparison of anorexigenic agents, ab 974
and hypnosis, ab 728
in juvenile obesity, ab 730
liothyronine therapy, ab 502
methods, f 22, ab 594
patient selection for successful, ab 978
Refrigeration
equipment, sanitation standards for, nn 406
reach-in, ab 856
rules for storage, ab 392
Rehabilitation
educating the patient, ab 606
energy-saving kitchen, bulletin, nn 194
for handicapped homemakers, cc 711
home
-care team for, ab 608
design for handicapped, ab 606
hospital dietitian in, cc 710
nutrition in, ab 606
Religion and spread of citrus fruit, ab 388
Renal enzyme adaptation and amino acids, ab 278
Reports, writing of, cc 1173
techniques, *351
Research, translating from animals to man, ab 1296
Research diets, variability in, ab 598
Retinal hemorrhage and diabetes, ab 276
Retinopathy, diabetic, and vitamin $B_{12}$, ab 842
Rhubarb, buying, ab 620
Riboflavin
deficiency, effect of climatic temperature in, ab 1084
destruction in partially baked rolls, ab 1293
enrichment of rice, ab 161
excretion and nitrogen intake, ab 1295
in leukemic cells, ab 976
requirement, research need, *670
and skin disease, *925
Ribose metabolism, ab 163
Rice
cooking quality of, ab 160
discolored, nutritive value of, ab 496
enrichment with riboflavin, ab 161
expansion in cooking, ab 1074
water absorption and inorganic salts, ab 1184
Roberts, L. J.
Essay Award
goes to P. E. Lufkin, 1062
rules of, ed 948
receives honorary doctorate, nn 192
Roentgenograms in estimating body fat, ab 166
Rolls, partially baked, riboflavin destruction in, ab 1293
Rose, M. S., Fellowship
goes to G. W. Strain, 1062
rules of, ed 947

S

Safety
cutlery accidents, protection from, ab 294
demands teamwork, ab 294
equipment for food service, ab 294
fire protection program, ab 1300
injuries in hospital food service, f 681
maintenance program promotes, *565
planning at blueprint stage, ab 296
preventing back strain, ab 854
Safflower oil
-pyridoxine mixture, effect on serum cholesterol, ab 724
to reduce serum cholesterol, ab 376
Salads, ab 1200
Salicylate, insulin equivalence of, ab 720
Saliva secretion indicates emotional state, ab 1072
Salmon, composition after storage, ab 722
Salt
accumulation in ham curing, ab 1186
effect on water absorption in rice, ab 1184
and hypertension, ab 270
intake
and blood pressure, f 130
in pregnancy, ab 382
metabolism in hypertension, ab 492
preserving effect in meat, ab 1292
and whipping egg whites, ab 600
Sandwich
fillings, protein-base, bacterial growth in, *131
-making, ab 60
Sanitation
cold water glass washing, nn 1328
cooling white sauce with flowing water, *1275
of dishes, ab 166
employees' role in, ab 1302
for food service workers, ab 174
maintenance for, *565
regulations in Britain, ab 836
self-inspection to maintain, ab 966
of tabletops and counters, ab 168
Sardines, Maine production, ab 970
Sauce
cooling with flowing water, *1275
preparation of, ab 290
white, ab 180
Sausage
irradiated, storage of, ab 1076
supplies, nn 1108
Scales to control costs, ab 398, ab 854
Scallops, irradiated, storage of, ab 1076
Scheele, C. W., biographical note, f 1308
Schizophrenia and tryptophan, ab 730
School lunch
in Asia, report, nn 992
audio-visual aids for, nn 518
business aspects of, ab 1300
educating pupils' tastes, ab 60
equipment for kitchens, ab 292
Friday menu problems, ab 1298
resolution on management, f 744
Scrap iron intoxication, ab 52
Scullery, pot and pan washing machines, ab 64
Scurvy
infantile, in Canada, ab 163
prevention in infants, ab 970
Seating, selection of, ab 60
Senile dementia, vitamin $B_{12}$ in, ab 972
Senility, dietary origins of, ab 1086
Serotonin
in bananas, ab 1084
and fruits, ab 836
-tryptophan metabolism in malignant carcinoidosis, ab 1184
17-ketosteroid excretion, ab 164
Shared dietitians, work of, cc 956
Shark protein
amino acids in, ab 1072, ab 1072, ab 1072
strepogenin-like activity in, ab 1072
Sherman, H. C., biographical note, f 1100
Silver, tableware, history, cc 582
Size, effect on cooking beef roast, *569
Skate protein
amino acids in, ab 1072, az 1072, ab 1072
strepogenin-like activity in, ab 1072
Skin disease
and diet therapy, *923
and fatty acids in infants, ab 155
unsaturated fatty acids in acne, ab 968
Smoking, weight gain after stopping, ab 606
Smorgasbord, origin of, f 127
Smrha, A., honored, nn 862
Social pressure and arteriosclerosis, f 44
Sodium
in Hawaiian diets, *122
intake and development of hypertension, ab 976
in instant coffee, ab 1196
low-, diets, ab 162
bananas in, ab 165
metabolism, after surgery, ab 724
in 95 foods, *1170
plasma, water balance and, ab 492
in pregnancy, ab 280
in Puerto Rican foods and waters, *1165
retention postoperatively, ab 612
in salt-water fish, *1163
Sodium chloride, toxicity, ab 156
Sodium cyclamate, sweetness compared with sucrose, ab 970
Soft drinks, British regulations on, ab 840
Sore-throat, milk-borne streptococcal, ab 608
Soups, made from concentrated bases vs. meat stocks, f 153
South Africa, serum protein in natives, ab 612
South Carolina
atherosclerosis compared with Haiti, *919
dietary study of Negroes in, *910
heart disease in Negroes, ab 848
South Pacific, nutritionist's work in, cc 951
South Pacific Commission, work of, ab 1082
Southwest, food habits in, ab 594
Soya oil and cholesteremia, ab 382
Soybean
history of, f 249
protein in simulated frankfurter and bologna, ab 970
trypsin inhibitor destroyed by heat, ab 1072
Space
nutrition, *13, ab 606, ab 844, ab 1293
travel, biologic problems, f 809
Specifications for cooking equipment, ab 1298
writing of, f 568, ab 856
Spices, ab 616
Spoilage, food, preventing, ab 1302
Spores, effect of antibiotics on, ab 970
Sprue
effect of steroid therapy in, ab 972
xylose tolerance in, ab 492
Staffing, plan to save labor hours, ab 984
Staling
of bread, f 246
in cake, factors, ab 836, f 1031
Standards, sanitation, for food vending machines, ab 56
Starch
-eating women, *810
selection for cooking, ab 1092
Starvation, semi-, high-fat diet in, ab 608
State dietetic associations
Alabama, nn 412, nn 516, nn 630, nn 1213
Arkansas, nn 526, nn 630, nn 1328
Arizona, nn 80, nn 516
California, nn 82, nn 200, nn 306, nn 758, nn 1214
Colorado, nn 200, nn 758, nn 1328
Connecticut, nn 82, nn 308, nn 402, nn 410, nn 516
Delaware, nn 516, nn 520
District of Columbia, nn 200, nn 310, nn 872, nn 876, nn 998
Florida, nn 630, nn 998, nn 1000, nn 1328
Georgia, nn 306, nn 516, nn 758
Hawaii, nn 306, nn 520, nn 1214
Idaho, nn 516
Illinois, nn 310, nn 522, nn 874, nn 1000
Indiana, nn 82, nn 412, nn 516, nn 630
Iowa, nn 84, nn 516
Kansas, nn 84, nn 516, nn 522, nn 1214
Kentucky, nn 310, nn 522
Louisiana, nn 84, nn 1214
Maine, nn 874
Maryland, nn 84, nn 758, nn 1000, nn 1330
Massachusetts, nn 308, nn 516, nn 760
Michigan, nn 84, nn 202, nn 632
Minnesota, nn 516, nn 522, nn 632
Mississippi, nn 86
Missouri, nn 516
Nebraska, nn 760, nn 1216
New Hampshire, nn 516
New Jersey, nn 84, nn 308, nn 410, nn 632, nn 874, f 934
New Mexico, nn 412, nn 762
New York State, nn 308, nn 412, nn 632, nn 1000, nn 1330
North Carolina, nn 202, f 370, f 676, nn 762
North Dakota, nn 634, nn 762
Ohio, nn 86, nn 412, nn 524
Oklahoma, nn 308, nn 410, nn 516
Oregon, nn 86, nn 516, nn 524, nn 1330
Pennsylvania, nn 412, nn 516, nn 524
South Carolina, nn 86, nn 202, nn 516, nn 634, nn 874, nn 1000
South Dakota, nn 86, nn 1000
Tennessee, nn 412, nn 762
Texas, nn 412, nn 516, nn 526, nn 764
Utah, nn 516, nn 764
Virginia, nn 86, nn 412, nn 516, nn 526, nn 1000
Washington State, nn 526, nn 1330
West Virginia, nn 86
Wisconsin, nn 412
Wyoming, nn 516
Steam
cooker, ab 506
cooking with, ab 64, ab 854
electric, ab 506
Steatorrhea
after gastrectomy, ab 594
labeled fat in diagnosis, ab 492
Steroid therapy in sprue, ab 972
Stiebeling, H., honored, nn 298
Stock pot, uses in restaurants, ab 168

Stomach-emptying, fatty vs. normal breakfasts, effect on, ab 161
Storage
  of canned comminuted meat, ab 51
  of cottage cheese, nn 198
  effect
    on salmon composition, ab 722
    on vitamin $B_6$, ab 978
  of food, ab 392, ab 1302
  of irradiated meat, ab 161
  of potato granules, ab 161
  poultry, coatings to extend shelf-life, ab 498
  refrigerated, rules for, ab 392
Strain, G. W., receives M. S. Rose Fellowship, 1062
Strawberries, frozen, ascorbic acid tells history of, ab 272
Strepogenin-like activity in casein, shark, and skate protein, ab 1072
Strontium
  absorption, effect of lactose on, ab 1084
  in food, ab 610, ab 1078
  in human bone tissue, ab 500
  in man, ab 844
  method to remove from milk to be studied, nn 1328
  in milk, ab 596, f 448
  soil contamination with, ab 58
  in wheat plants, ab 844
  in U.S. water supplies, nn 1316
Students
  as college food service employees, cc 364
  nursing, diets of, ab 1296
Submarine
  feeding in nuclear, ab 506
  food service in, ab 734
  recipes published, nn 302
Sucrose
  and caries, ab 728
  sweetness compared with calcium cyclamate, ab 970
Super-market, dietitian in, cc 151, l 858
Supervision
  achieving competence in, ab 1300
  art of, ab 1094
  defined, ab 1304
  rules of, ab 184
  sharing—"musts" in relation to, ab 1090
Supervisors
  delegation, ab 286
  government publications for, nn 1106
  training, ab 178, ab 854, 1063
Supplements
  of flour with lysine, ab 728
  food
    with amino acids, ab 840
    fatty acids, essential, in, ab 722
  with vitamins, ab 498
Surface area and body weight in studying energy, ab 598
Surgery
  aspiration of food after, ab 52
  complications in obese, ab 968
  for diabetic patients, ab 504
  fat metabolism after pancreatectomy, ab 492
  gastrectomy
    androgenic hormone after, ab 840
    carbohydrate metabolism after, ab 836
    dumping syndrome after, ab 600
    effect of beverages on gastric secretions after, f 950
    iron absorption after, ab 972
    steatorrhea after, ab 595
    subtotal, adjustment after, ab 1184
    vitamin $B_{12}$ absorption after, ab 500
  gastric, postoperative symptoms, ab 834
  intestinal resection, nutrition after, ab 382
  intravenous fat emulsion in, ab 1088
  lipids
    metabolism in, ab 966
    mobilization after, ab 720
  for peptic ulcer, ab 968
  plasma levels of fatty acids, glyceride, and phospholipids, ab 974
  postoperative diet, *17
  sodium
    and potassium metabolism after, ab 724
    retention after, ab 612
Surveys, dietary, methods compared, *672
Survival
  high-fat diet for, ab 608
  pemmican for, ab 608
Sweet potatoes
  irradiated, storage of, ab 1076
  new products from, ab 51
  nutrients in, ab 382
  sliced, precooked frozen, ab 1194
Sweetness
  of calcium cyclamate and sucrose, ab 970
  preference in red, sour, pitted Montmorency cherries, ab 970
Swine, atherosclerosis in, ab 159

T

Table
  sanitation of, ab 168
  settings, ab 398
    frame food, ab 850
Tableware, ab 392
  paper, used with electronic cooking, cc 260
  plastic, ab 506
Taboos, food, in the African, ab 730
Taste
  factors in food, *227
  sensitivity in aged, ab 972
Taste testing panels, students vs. consumers, ab 1194
Tasting, measuring preferences for food combinations, ab 1076
Tasting table to gain food acceptance, f 264
Tea made with hard water, nn 1316
Teachers, food intake of, ab 598
Teaching
  preparation to teach nutrition, *802
  problems in, *797
Teeth
  children's, in London, ab 270
  composition and diet, ab 728
  diet and dental health, ab 53, ab 270
  formation, variability of, ab 284
  periodontal disease and food, ab 610, ab 610
  stannous fluoride and, ab 282
Temperature
  climatic, and human utilization of ascorbic acid, *139
  effect in riboflavin deficiency, ab 1084
  holding, effect on asparagus, ab 278
  internal, effect on cooking beef roast, *569
  tolerance in frozen foods, *128
Tenderizers, meat, ab 50, ab 50
Tenderness
  of chicken, ab 600
  effect of age in beef, ab 972
  of poultry, ab 498
Tennessee, broiler use in, nn 304
Tension and arteriosclerosis, f 44
Terminology, "dietetic" foods, f 256
Thailand
  food habits in, *1143
  food intake in, *1149
  nutritional status in, *1149
Thiamine
  deficiency, and erythrocyte metabolism, ab 276
  in frozen chicken, ab 972
  in frozen ham loaf, ab 972
  in frozen Italian rice, ab 972
  needs of adolescent boys, ab 278
Thickening agents, selection for cooking, ab 1092
Thyroxin and amino acids, ab 730
Time-temperature tolerance in frozen foods, *128
Tobacco, hypoglycemia from smoke, ab 968
Tocopherol
  deficiency, ab 1295
  effect on frozen pork, ab 970
Tolbutamide
  and diabetic neuropathy, ab 724
  in sun-diabetes, ab 1296
  in treatment of diabetes, ab 968
Tomatoes, powdered, storing of, ab 51
Tortillas, nutrients in, ab 51, ab 51
Training
  audio-visual aids in, ab 616
  course for food service workers published, nn 994
  employees, cc 368
  executives, ab 616
  in food preparation, ab 616
  of fry cooks, ab 60
  of hospital personnel, ab 983
  of managers, ab 1302
  and morale, ab 394
  organizing school for, ab 616
  of supervisors, ab 178, ab 854
  of waitresses, ab 180
Transportation, vertical in food service, ab 392
Tranquilizers, cause of weight gain, ab 166
Trays
  appointments for, ab 614
  covers, trend to paper, nn 518
Trichinosis, ab 504
Triglycerides
  and dietary fat, ab 1294
  in heart disease, ab 492
Trypsin inhibitor in soybeans, heat destroys, ab 1072
Tryptophan
  metabolism, ab 386
    and niacin, ab 386
  metabolized to serotonin, ab 1184
  peroxidase activity, ab 56
  in schizophrenia, ab 730
Tube feeding, ab 602
  formula for, ab 506
Tuberculosis and dietary fats in mice, ab 163
Tuna, facts on, f 145
Turkey
  amino acids in, *247
  biologic value of, *1251
  antibiotic treatment of, ab 274
  salad
    bacteria in, *38
    sandwich filling, bacterial growth in, *131
  source of gastroenteritis, ab 1200
  source of ornithosis in man, ab 156
  tenderness of, ab 380
Turner, D. F., receives Copher Award, 1060
Turnip greens, vitamin $B_{12}$ in, ab 728
Turnover, labor, cost of, ab 736
Typhoid from oysters, ab 382
Tyrosine converted from phenylalanine in phenylketonuria, ab 284

U

Ulcerative colitis, ab 1088
Ulcer
  peptic
    diet and, ab 974
    surgery for, ab 968
  postoperative symptoms, ab 834
Ultrasonic defrosting of frozen foods, ab 498
Underweight
  treatment in children, ab 836
  weight gain in, ab 490
Uniforms, ab 390
  fabrics for, ab 48
United Nations Children's Fund, f 350
Univ. of Kansas Medical Center graduate program in dietetics, f 560
Univ. of Tennessee/India contract to develop home science, *453

V

Vanadium as cholesterol synthesis inhibitor, ab 1082
Van Horne, M., joins A.D.A. staff, nn 1330
Vascular degeneration and overeating, ab 274
Vegetables
  ascorbic acid loss in fresh, ab 1078
  calcium availability in, ab 726
  carotenoids affected by irradiation, ab 1076
  color, effect of irradiation on, ab 1076
  cookery, ab 980
    Chinese, ab 384
    method, effect on ascorbic acid retention and color, *578
  flavor changed with pesticides, ab 972
  in infant feeding, history of, *692
  minerals in, ab 1293
  mixture, protein value of, ab 1297
  radioactivity of, nn 1314
  storage to save ascorbic acid, f 815
Vegetarian diets, ab 164
  amino acid supplements for, ab 1074
  metabolism of children in India on, ab 1072
  with rice, cause fatty liver, ab 1074
Vegetarians, malnourished children in India, ab 970
Vending machines
  in college food service, ab 504
  for food, ab 56
Ventilation in kitchens, ab 854
Visual aids, home-made, ab 986
Vitamin supplementation, ab 498
Vitamin A
  absorption in kwashiorkor, ab 594
  deficiency in world, *444
  and goiter, ab 278, ab 1200
  intestinal function of, f 937
  and skin disease, *925
Vitamin B deficiencies, ab 155
Vitamin $B_6$
  deficiency in pregnancy, ab 1200
  effect of storage on, ab 978
  retention in meat, ab 726
  and skin disease, *926
Vitamin $B_{12}$
  absorption, ab 602, ab 724
    after gastrectomy, ab 500
  adult requirement of, ab 156
  in aged, ab 622
  in azotobacter, ab 54
  and diabetic retinopathy, ab 842
  in dog's liver, ab 384
  and growth of Guatemalan children, ab 594
  as index of hepatic damage, ab 1291
  and liver
    function, ab 600
    and kidney, ab 726
  metabolism in pregnancy, ab 378
  need in anemia, ab 384, ab 840
  and nitrogen metabolism, ab 606
  oral, fails in pernicious anemia, ab 1291
  radioactive, instability of, ab 608
  in senile dementia, ab 972
  in turnip greens, ab 728

Vitamin $D_2$, activity in blood serum, ab 1082
Vitamin K
deficiency from irradiated beef, ab 1295
in liver disease, ab 720
problem in irradiated food, *238
Vitamin $K_3$ as food preservative, ab 50
Vitamins
in human milk and economic status, ab 386
interrelationships with amino acids, *929
research advances, *111
and skin disease, *925
Vomitus, aspiration in infants and surgical patients, ab 52

W

Waiters, student, training of, ab 1088
Waitresses
selection of, f 475
training, ab 508
Walking, caloric expenditure in, ab 1078
Waste disposal equipment, ab 736
Water
absorption in rice and inorganic salts, ab 1184
bacteria in hospital bedside carafes, ab 280
balance and plasma sodium, ab 492
deprivation and serum cholesterol, ab 1078
drinking, isotopes in, ab 974
and dysentery, ab 378
effect on coffee flavor, ab 272
hard, cooking with, nn 1318
metabolism on dry diets, ab 834
need in space flight, *15
sodium and potassium in Puerto Rican, *1165
strontium-90 in U.S. Supplies, nn 1316
Watermelon, spring, nn 408
Waxed containers as possible carcinogens, ab 1297
Waxy rice flour, new uses for, nn 756
Weight
changes and food intake, ab 594
gain
after stopping smoking, ab 606
in underweight persons, ab 490
and height, new insurance data, f 1254
Wheat
amino acids in, ab 160
germ, defatted, to improve cereals, ab 160
lysine limiting amino acid in, ab 1295
plants, strontium-90 in, ab 844
radiation of, ab 1292
recent research on, ab 610
White House Conference on Aging, nn 1112
White House Conference on Children and Youth, nn 1114, f 1286
White sauce cooled by flowing water, *1275
Wilder, R. M., made honorary member of A.D.A., 1063
Wine
in hospital food service, f 363, l 858
usage by population, ab 51
Women
ascorbic acid status of, ab 164
fat in diets of, *935
in industry, feeding, ab 610
post-adolescent, diets of, *687
self-chosen diets of, ab 382
status of, in Iraq, *449
Wood, L., honored, nn 752
Work simplification, ab 294, *348
Workshop, instructing in, ab 612
World Health Organization
Iron Deficiency Anemia—Report of a Study Group, published, nn 1210
World nutrition problems, *441
Writing
booklet to help authors of technical books, nn 1212
methods of improving, f 452, *1037
pamphlets on techniques, nn 626
reports, techniques, *351

X

Xylose tolerance in sprue, ab 492

Y

Yeast, torula, supplements and nitrogen balance, ab 1295
Yields of recipes, calculating, cc 45
Yoghurt, food value of, ab 1082
Young, C. M., honored, nn 862
Young, J. R., biographical note, f 461

Z

Zinc
in foods and people, ab 388
metabolism in liver dysfunction, ab 968
Zoonoses, report on, nn 1106

## PERIODICALS ABSTRACTED IN THE CURRENT LITERATURE SECTION OF THE JOURNAL

Adult Leadership
American Journal of Clinical Nutrition, The
American Journal of Digestive Diseases, The
American Journal of Gastroenterology, The
American Journal of the Medical Sciences, The
American Journal of Medicine, The
American Journal of Nursing, The
American Journal of Obstetrics and Gynecology
American Journal of Physiology
American Journal of Psychiatry, The
American Journal of Public Health
American Journal of Surgery, The
American Restaurant
Annals of Biochemistry and Experimental Medicine (India)
Annals of Internal Medicine
Archives of Dermatology
Archives of Internal Medicine
Archives of Pediatrics
Archives of Surgery
British Journal of Nutrition, The
British Medical Bulletin
British Medical Journal
Canadian Journal of Public Health
Canadian Medical Association Journal, The
Cereal Chemistry
Children
Chronicle of the World Health Organization
College and University Business
Diabetes
Diner Drive-In
Endocrinology
Fast Food Magazine
Food Engineering
Food and Nutrition Notes and Reviews
Food Research
Food Service Magazine
Food Technology
Gastroenterology
Geriatrics
Hospital Administration
Hospital Management
Hospital Progress
Hospital Topics
Hospitals
Hotel Monthly, The
Inplant Food Management
Institutions
Journal of Agricultural and Food Chemistry
Journal of the American Geriatrics Society
Journal of the American Medical Association, The
Journal of Aviation Medicine, The
Journal of Biological Chemistry, The
Journal of the Canadian Dietetic Association, The
Journal of Clinical Investigation, The
Journal of the Dietetic Association—Victoria
Journal of Home Economics
Journal of the Indian Medical Association
Journal of J. J. Group of Hospitals and Grant Medical Colleges (India)
Journal of Laboratory and Clinical Medicine, The
Journal of the National Cancer Institute
Journal of Nutrition, The
Journal of Pediatrics, The
Journal of School Health, The
Lancet, The
Licentiate (India), The
Medical Clinics of North America, The
Medicine
Milbank Memorial Fund Quarterly, The
Military Medicine
Modern Hospital, The
NRA News
New England Journal of Medicine, The
New York State Journal of Medicine
New Zealand Medical Journal
Nursing Outlook
Nutrition
Nutrition Abstracts & Reviews
Nutrition Reviews
Personnel Journal
Physiological Reviews
Proceedings of the Nutrition Society
Psychiatric Quarterly
Psychosomatic Medicine
Public Health Reports
Restaurant Management
Royal Society for the Promotion of Health Journal
Sanitarian, The
School Lunch Journal
Science
South African Journal of Laboratory and Clinical Medicine
Southern Medical Journal
Surgery, Gynecology and Obstetrics
Surgical Clinics of North America, The
Texas State Journal of Medicine
Tohoku Journal of Experimental Medicine, The
United States Armed Forces Medical Journal
Volume Feeding Management
What's New in Home Economics
World-Wide Abstracts of General Medicine

# AUTHOR INDEX


A

Adams, S. F., *692
Aldrich, P. J., cc 45
Alldredge, E. O., *1037
Allen, I. B., br 592
Anderson, D. M., *1158
Apgar, J., *1260
Armstrong, M. B., br 1182
Armstrong, M. R., *453, br 1182
Arrington, L. R., *816

B

Balsley, M., f 809
Bannister, A. C., *1163
Barber, E. M., br 1290
Bates, D. J., br 716
Bauer, C. D., *245
Bayles, V. M., br 484, br 484, br 824
Bechtel, J., cc 257
Beeuwkes, A. M., *797
Behrman, M., br 1070
Betar, Y., br 824
Bettis, H., f 370, f 676
Bez, E. M., cc 710
Bhagavan, R. K., br 1182
Biester, A., *935
Black, J. T., *556
Blake, F. G., br 592
Blaker, G. G., *551, *1255
Block, R. J., *245
Bortz, E. L., f 822
Bosley, B., *905
Boucheron, P., br 824
Bowes, A. deP., br 716
Bradford, M. S., l 858
Brandt, M. B., f 121
Breckenridge, M. E., *704
Browe, J. H., *789
Burrill, L. M., *935

C

Calbert, H. E., f 703
Callahan, J. F., cc 45
Cancio, M., *1165
Canfield, J. H., f 568
Cantor, A. J., br 484
Carroll, S. C., *1027
Caso, E. K., br 1182
Chapman, V. J., *359
Clark, H. E., *469, *1251
Clark, S. J., *23
Consolazio, C. F., *462
Cooper, L., F., br 1290
Cornfeld, L., l 858
Cox, N., *1260
Cranwell, J. P., br 964
Cronin, M. T. l., f 44
Cutlar, K. L., *38

D

Davis, A., br 1290
Davis, M. A., f 1057
DeEds, F., *19, *128
DeSilva, H., l 860
Dobbin, E. V., br 154
Dolan, I. L., f 138
Donan, J., br 1182
Downey, I., *1260
Dozier, M., *476

E

Ebbs, J. C., *13, br 716
Edwards, C. H., *810
Einset, B. M., *115
Eisen, J. N., *359
Ekdahl, L. D., l 860
Elliott, F. E., *1052
Eppright, E. S., *449, f 1286
Ezell, B. D., f 815

F

Fenton, F., *1260
Finance, C., br 266
Flanagan, J. J., f 962
Floore, F. B., cc 582
Foster, J. T., *472, *561
Franz, M., *1170
Friedman, L., *574
Fry, P. C., *687
Futrell, M. F., *139

G

Galbraith, A. L., *476
Garb, S., br 1070
Gebhard, B., f 796
Gibb, J. R., *333
Gillette, B., br 1070
Gilpin, G. L., *354, *359
Gilson, M., *476
Gofman, J. W., br 154
Gordon, J., *241, *578
Grant, F. W., *910
Griffin, M. M., cc 368
Grimes, E. T., *139
Groom, D., *910, *919
Gunning, R., f 452
Gunter, J. F., br 1182

H

Hall, M. L., cc 956
Hankin, J., *802
Hanks, J. R., *1143
Harrel, C. G., br 1182
Harrison, D. L., *1270
Hartman, J., *472, *561
Hartman, R. H., *34
Hatch, L., *476
Hauck, H. M., *1143, *1149
Haun, P., *1048
Hayes, M. A., *17
Haymond, J., f 922
Hegsted, D. M., *669
Henry, C. E., cc 149
Heseltine, M. M., *793
Hoover, S. R., cc 1178
Howard, H. W., *245
Howe, J. M., *469
Hunt, F. E., *457
Hutchinson, R. C., br 716

I

Indiana Dept. of Public Instruction, br 1290
Indiana Restaurant Assn., br 1290
Indiana Univ., br 1290
Inyard, D. W., br 964

J

Jeans, P. C., br 592
Jester, W. R., f 1157
Johnson, O. C., *462
Johnston, F. A., *23, *31
Jones, L., *810
Jutton, D. R., nn 414

K

Kaiser, E. M., cc 364
Karl, C., br 592, br 964
Katz, L. N., br 1290
Katzanek, B., *462
Kaufman, M., f 226
Kemp, A. M., *810
Kendall, F., br 964
Keys, A., br 484
Keys, M., br 484
Kiecker, C., *1170
Kimball, J., f 475
Kime, N. S., *23
Kincaid, J., f 801
King, C. G., *109
Kirk, R. B., *66, *186, *268, *372, *486, *718, ed 1055
Klassen, I. W., nn 414
Knobloch, H., f 573
Kotschevar, L. H., f 153
Krehl, W. A., *923
Kusner, C., ed 1288

L

Laing, D., *810
Lamanna, C., br 1290
Lansing, A. I., br 1290
Larsson, N. R., nn 204, nn 766, nn 866
Leon, J. M., *1165
Lewis, M. N., f 950
Litchfield, J. H., *225
Lombard, P. B., f 1164
Long, R. S., br 964
Longley, E. K., f 1054
Longrée, K., *38, *131, *1275
LoPinto, M., br 484
Lyman, M. M., *115
Lynch, C. W., *131

M

Macomber, M. H., l 858
Mallette, M. F., br 1290
Maltese, M., f 934
Mamer, L. J., *565
Marshall, N., *569
Martin, E. A., br 1290
Martin, M. E., *354
Mason, L., *810
Mason, M., f 950
Matson, R. A., br 716
McCann, M. B., *672
McCollum, E. V., *806
McCollum, E. B., *808
McCulloch, E., br 1182
McDonald, S., *810
McLaren-Hume, M., f 468
McLaughlin, L., *139
Melrose, M., cc 711
Mertz, E. T., *469
Miller, C. D., *122
Miller, F. D., br 716
Mitchell, H. S., br 1290
Mitchell, J. R., *810
Monson, W. J., *245
Moore, M. E., br 266
Moragne, L., *1275
Muto, S., f 820

N

Newcomer, J. L., *1255
Noble, I., *241, *578
North, M. S., l 858

O

Oglesby, L. M., *1163
Okey, R., *115
Olson, R. E., f 22

P

Pasamanick, B., *573
Patton, M. B., *457, *569
Perry, E. F., l 858
Phelan, M., *1170
Philomene, br 824
Pick, R., br 1290
Pollack, H., *235
Pollen, T., 1058

Q

Queneau, M. J., br 824

R

Radke, M. E., *338, *343
Ratcliffe, H. L., f 44
Reed, J. M., *230
Reed, R., f 347
Reitz, L. L., *469
Rice, E. E., *34
Robins, E., *1041
Robinson, C., ed 945
Roe, C. E., cc 1178
Roswell, C. G., *351
Rynbergen, H. S., br 1290

S

Savitsky, E., *938
Schill, J. H., f 1068
Schuck, C., *935
Scott, M. L., *247
Scrimshaw, N. S., *441
Sejnost, R. L., cc 1173
Serpico, P. A., br 964
Simerson, F. W., *348
Sjostrom, B. B., *227
Smith, C. E., cc 146
Smith, E. E., f 33
Smith, J. M., cc 1065
Somers, I. J., *230
Sparks, E. H., br 484
Stafford, W. D., *1255
Staley, M. G., *354
Stamler, J., br 1290
Stead, E. S., br 592
Stefanik, P. A., br 154
Stefferud, A., br 1290
Stief, R., cc 711
Stiller, J., br 1182
Stunkard, A., f 468
Sudsaneh, S., *1143, *1149
Swaminathan, M., br 1182
Swank, R. L., br 964
Swanson, A. M., f 703
Sweeney, J. P., *354, *359
Syme, D. E., f 366

T

Terrell, M. E., br 266
Thelen, R. J., br 1182
Thomason, M. J., br 1182
Thompson, D. H., f 249
Thorangkul, D., *23, *31
Tinklin, G. L., *1270
Todhunter, E. N., f 30, f 72, f 190, f 234, f 337, f 461, f 577, f 750, f 792, f 918, f 1100, f 1172, f 1308
Trigg, L., *810
Trulson, M. F., *672
Tucker, R. E., nn 878
Turner, D. F., 1061, br 1182

V

Vail, G. E., *119, *1251
Vanderwarker, R. D., *1032
Vanek, E., l 858
Van Syckle, C., *1283
Varandani, P. T., f 937
Vecker, D., f 1036

W

Wagstaff, M. A., br 592
Walker, M., *122
Walters, R. M., cc 151, l 858
Warren, G. K., br 592
Welch, H., f 1157
Welton, H. H., cc 1178
Wenkam, N. S., *122
West, R., br 266
Whedon, G. D., *682
Whitacre, J., *139
White, J. C., *38, *131, *1275
Whiteman, J., cc 951
Wilcox, M. S., f 815
Willett, R., cc 260
Williams, H. H., *929
Williams, I. F., cc 146
Williams, R. C., br 1182
Williams, R. J., br 1182
Willman, A. R., *38
Womack, M., f 805
Wood, C. L., cc 821
Wood, L., *569, 1060, *1139
Wright, H., br 592
Wright, W. W., f 1157

Y

Yang, S. P., *1251
Youland, D. M., br 1070
Youmans, J. B., f 130
Young, C. M., *677

Z

Zetterstrom, M., *938

**Index To Advertisers**


Abbott Laboratories ..... Cover 2
Allen Foods, Inc. ..... 1341
American Gas Association ..... 1331
American Meat Institute ..... 1301

Bolta Products Company ..... Cover 4

Canned Dairy Products, Inc. ..... 1342
Cereal Institute, Inc. ..... 1246
Chicago Dietetic Supply House, Inc. ..... 1332
Cleveland Range Company ..... 1312
Continental Coffee Company ..... 1338
Cramore Fruit Products, Inc. ..... 1332
Custom Food Products, Inc. ..... 1303

Diamond Crystal Salt Co. ..... 1325-1326
The Dietene Company ..... 1237

Florida Citrus Commission ..... 1244
Food Machinery & Chemical Corp. ..... 1341
Franklin Products Corp. ..... 1302

Gerber Products Company ..... 1313
S. Gumpert Co., Inc. ..... 1238

Hall China Company ..... 1333
H. J. Heinz Company ..... 1336-1337
Herrick Refrigerator Company ..... 1334
Hoffmann-La Roche, Inc. ..... 1316-1317-1318-1319-1320 1321-1322-1323-1324

International Molded Plastics, Inc. ..... 1311

Jarvis & Jarvis, Inc. ..... 1327

Klenzade Products, Inc. ..... 1339
Koch Refrigerators, Inc. ..... 1309

Legion Utensils Co., Inc. ..... 1330
Libbey Glass Co. ..... 1305
J. B. Lippincott Company ..... 1304

Malt-O-Meal Company ..... 1248
Metropolitan Wire Goods Corp. ..... 1314
Middleby-Marshall Oven Company ..... 1339

National Biscuit Company ..... 1243
The H. R. Nicholson Company ..... 1339

Samuel Olson Mfg. Co., Inc. ..... 1343
Oneida Silversmiths ..... 1315

Pet Milk Company ..... 1307
Plastics Mfg. Company ..... 1249
Procter & Gamble Company ..... 1329

The Quaker Oats Company ..... Cover 3

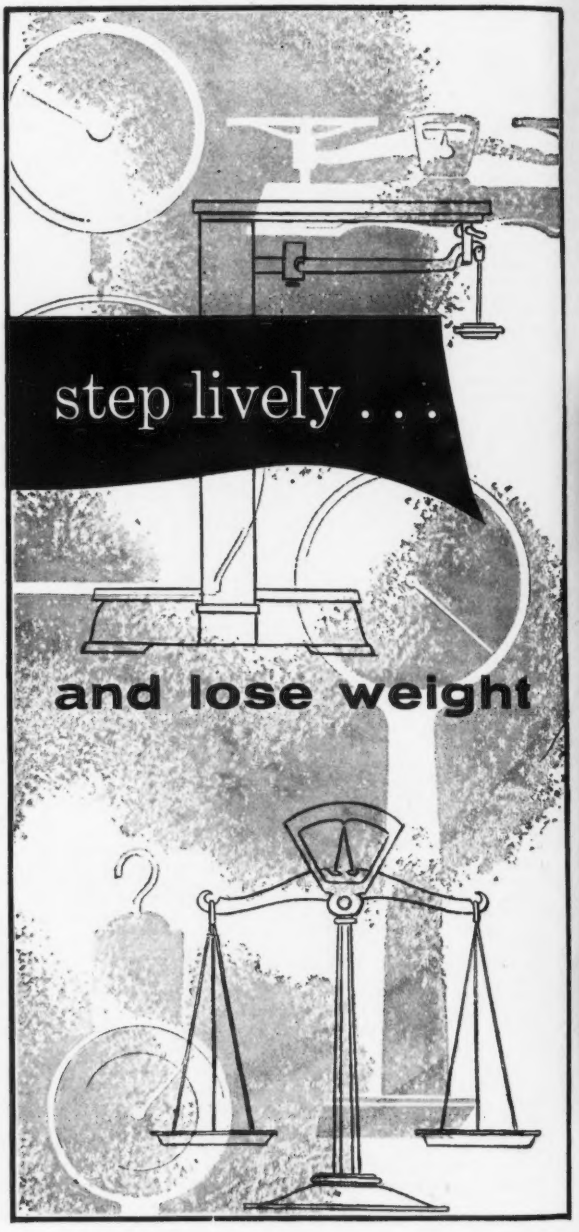
Rich Products Corporation ..... 1343

Savory Equipment, Inc. ..... 1306
John Sexton & Company ..... 1250
Smithfield Ham & Products Co. ..... 1341
Swartzbaugh Mfg. Company ..... 1247
Syracuse China Corp. ..... 1300

Toastmaster Division—McGraw-Edison Company ..... 1245

The Wesson People ..... 1299
Wheat Flour Institute ..... 1335






Step lively . . . . . is designed to give weight reduction patterns which will bring pleasing results, satisfy hunger and supply energy to meet the demands of everyday living. It is ideal for use with all persons seeking guidance in weight reduction. Very reasonably priced at 3 cents per copy, $1.25 for 50 copies and $2.00 per 100 lot orders.

**THE AMERICAN DIETETIC ASSOCIATION**
**620 NORTH MICHIGAN AVENUE**
**CHICAGO 11, ILLINOIS**

DOES NOT CIRCULATE THE UNIVERSITY OF MICHIGAN
DEC 2 1959
MEDICAL LIBRARY

DECEMBER 1959
VOLUME 35
NUMBER 12

# JOURNAL of the american dietetic association

**Nutritive Value of Turkey Proteins**
*S. P. Yang et al.*

**Roasting Meat—Conventional vs. Foil Methods**
*Gertrude G. Blaker et al.*

**New Dimensions**
*Cora E. Kusner*

**43rd A.D.A. Annual Meeting**
**Cleveland**
**October 18 to 21, 1960**

*Sara Hervey Watts at The Old Original Bookbinder's in Philadelphia*

# Strawberry Cheesecake from the Old Original Bookbinder's

## ...now sweetened with Sucaryl

**Sara Hervey Watts reports another calorie-cutting recipe triumph from one of the world's 14 great restaurants.**

Since John Taxin, genial owner of Philadelphia's The Old Original Bookbinder's, one of America's oldest and most famous restaurants, introduced his family recipe for Strawberry Cheesecake, it has become nation-renowned. "I'm just delighted to find I can make cheesecake with Sucaryl!" said Mr. Taxin. "So many customers seem too weight-conscious for dessert these days." Sweetened with Sucaryl, Strawberry Cheesecake has about half as many calories, and all the same creamy-sweet delicious flavor. Non-caloric Sucaryl adds *only* delicious sweetness . . . leaves no bitter after-taste. That's why gourmet chefs and restauranteurs everywhere are proud to sweeten their specialties with Sucaryl . . . it saves all sugar's calories and you can't taste the difference!

Sara Hervey Watts

### Weight Watchers' Strawberry Cheesecake

*(adapted from the Bookbinder original)*

**Makes 10 servings—Saves 1150 calories**

2 tbsp. unflavored gelatin
¼ cup cold water
2 eggs, separated
¼ tsp. salt
1 cup skim milk
3 tbsp. Sucaryl solution
1 tsp. grated lemon rind
2 tbsp. lemon juice
1 tsp. vanilla
3 cups cream-style cottage cheese
½ cup nonfat dry milk
⅓ cup ice water
2 tbsp. crushed cornflakes
3 cups whole strawberries

Soften gelatin in cold water. Combine egg yolks, salt, milk, and 1 tbsp. Sucaryl in top of double boiler. Stir constantly over hot water until thickened. Remove from heat. Add the softened gelatin, lemon rind, lemon juice, vanilla. Let stand at room temperature until mixture begins to set. Force cottage cheese through sieve and fold into thickened gelatin. Beat egg whites until peaks form; fold into gelatin. Combine dry milk and ice water; beat until consistency of heavy cream; fold into gelatin mixture. Lightly oil sides and bottom of 9-inch round cake pan. Sprinkle cornflake crumbs on sides only. Spoon cheesecake mixture into pan; refrigerate until firm. Sweeten berries with remaining 2 tbsp. of Sucaryl. Arrange on top of cheesecake.

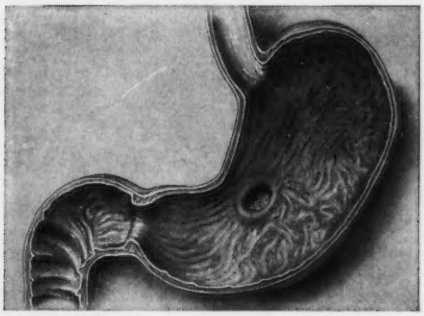
**FREE! Calorie-Cutting Recipes with Sucaryl!**

32 pages, kitchen tested by Sara Hervey Watts! Simple, easy-to-follow. Now at your drug store, or write ABBOTT LABORATORIES, North Chicago, Illinois, for ample quantities, plus free Sucaryl Samples.

®Sucaryl—Abbott's Non-Caloric Sweetener

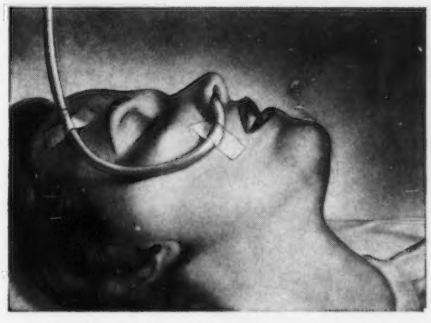
**Sucaryl®**

*When ordinary food must be supplemented*



**ULCERS** and other restricted diets, as in liver diseases and gall bladder conditions.

**POST-OPERATIVE** and other nutritionally depleted patients, such as geriatrics, prolonged convalescence, and chronic illnesses.



**TOTAL FEEDING,** whether by tube or orally, in conditions such as wired jaws and cancer of the oral cavity.

# Patients like Meritene

*The good-tasting protein-vitamin mineral supplement*

Have you tasted Meritene?

**ANALYSIS PER 100 GRAMS:**
365 calories; 33 gm. protein (non-fat dry milk); 0.2 gm. fat; 58.4 gm. carbohydrate; 15 mg. iron; 1 gm. calcium; 7000 IU vit. A; 2.4 mg. thiamin; 4.3 mg. riboflavin; 22 mg. niacin; 80 mg. ascorbic acid; 550 IU vit. D.

**MAIL COUPON FOR ONE LB. CAN**

**FREE**

THE DIETENE COMPANY MD 129
Highway 100 at W. 23rd St.
Minneapolis 16, Minnesota

Please send me *free* a 1-lb. can (regular $1.98 retail size) of Meritene protein-vitamin-mineral supplement.

Name_____

Address_____

City_____ Zone___ State_____

# Cold dessert...hot PROFIT builder

**Gelatine desserts from Gumpert are the ones by which others are judged—and compared. You're right—they are THE gelatines.**

**They are as clear as an October day—just hold them up to the light and see how each one sparkles. As to flavor—just taste them yourself—you'll keep right on eating, they're so good.**

**Being THE gelatines, they cost a bit more—and are worth it. But take a look at the profit picture—one package plus 4 quarts boiling water makes 40 servings at an approximate cost per serving of 1½c. You can even use as much as 5 quarts of water because of the high bloom gelatine used. No matter what your selling price is—man, that's profit!**

*IN 10 POPULAR FRUIT FLAVORS*

**See your Gumpert Representative for proven ideas and new recipes.**

GUMPERT'S GELATINES

**ONE OF 300 TESTED GUMPERT FOOD SPECIALITIES**

**S. GUMPERT CO., INC. • JERSEY CITY • CHICAGO • SAN FRANCISCO • HOUSTON**

COPYRIGHT, 1959, BY THE AMERICAN DIETETIC ASSOCIATION. Printed in U.S.A.

Second-class postage paid at Mount Morris, Illinois.

JOURNAL of the american
# dietetic association

## CONTENTS—DECEMBER 1959—VOLUME 35, NUMBER 12

NUTRITIONAL VALUE OF TURKEY PROTEINS. A Preliminary Study
*S. P. Yang*, Ph.D., *Helen E. Clark*, Ph.D., *and Gladys E. Vail*, Ph.D...1251

CONVENTIONAL ROASTING VS. HIGH-TEMPERATURE FOIL COOKERY. Effect on Cooking Time, Palatability, Weight Loss, and Fuel Consumption
*Gertrude G. Blaker, J. L. Newcomer*, Ph.D., *and William D. Stafford* 1255

COOKING PORK ELECTRONICALLY. Effect on Cooking Time, Losses and Quality
*Jean Apgar, Nancy Cox, Irene Downey, and Faith Fenton*, Ph.D. .....1260

COST AND QUALITY OF FRESH, FROZEN AND CANNED GREEN BEANS. Comparative Cost, Palatability, and Ascorbic Acid
*Gwendolyn L. Tinklin and Dorothy L. Harrison* .....1270

HEAT TRANSFER IN WHITE SAUCE COOLED IN FLOWING WATER
*Lenora Moragne, Karla Longrée*, Ph.D., *and James C. White*, Ph.D...1275

CALCIUM IN URBAN FAMILY FOOD SUPPLIES
*Calla Van Syckle*, Ph.D. .....1283

EDITORIAL

New Dimensions—*Cora E. Kusner*.....1287

BOOK REVIEWS .....1290

CURRENT LITERATURE .....1291

NEWS NOTES .....1310

INDEX TO VOLUME 35 .....1344

GOLDEN ANNIVERSARY WHITE HOUSE CONFERENCE ON CHILDREN AND YOUTH
MARCH 27–APRIL 2, 1960

*"to promote opportunities for children and youth to realize their full potential for a creative life in freedom and dignity"*

The Journal of The American Dietetic Association is published monthly by The American Dietetic Association, Mount Morris, Illinois. Neither the Association nor the Editor assumes responsibility for the opinions expressed by authors of papers abstracted, quoted, or published in full in this Journal.

*Subscription Rates:* $8 per year in advance in the U.S., Canada, and countries of the Postal Union; all other countries, $9 per year in advance. Special rate to undergraduate students and dietetic interns in approved internships, **$4 per year in advance.** All correspondence concerning Journal subscriptions, orders for copies, or reprints from the Journal, and notices of change of address should be sent to The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois. Notices regarding change of address should reach the publisher by the *5th of the month before the date of issue* on which the change is to take effect and both old and new addresses *must* be given. Claims for Journals lost in the mail will not be entertained more than six months after the date of the issue involved.

*Editorial Correspondence:* All articles and notices for publication, general correspondence, and inquiries should be sent to the Editor at The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois. Manuscripts are accepted for publication on condition that they are contributed solely to the Journal. Copy must be typewritten, double-spaced, and two copies, an original and one carbon, submitted.

*Advertising:* All correspondence concerning advertising should be addressed to The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois.

# OFFICERS 1959-60

*The American Dietetic Association*

## COORDINATING CABINET

**Executive Board**

*President:* DORIS JOHNSON, Ph.D., Director of Dietetics, Grace-New Haven Community Hospital, and Assistant Professor, Dept. of Public Health, Yale Univ. School of Medicine, New Haven 4, Conn.

*President-Elect:* MRS. CORA E. KUSNER, Director of Dietetics and Director of Approved Dietetic Internship, Colorado State Hospital, Pueblo.

*Speaker of the House of Delegates:* EDITH A. JONES, Chief, Nutrition Dept., Clinical Center, National Institutes of Health, Bethesda 14, Md.

*Secretary:* MARGARET L. ROSS, Ph.D., Professor of Nutrition and Director, School of Home Economics, Simmons College, Boston 15

*Treasurer:* EVELYN A. CARPENTER, Director of Dietetics, Philadelphia General Hospital, Philadelphia 4

**Section Chairman**

*Community Nutrition:* J. JUNE STEIN, Nutrition Consultant, Washington State Dept. of Health, Seattle 4

*Diet Therapy:* DOROTHY M. KINNEAR, Columbia-Presbyterian Medical Center, New York 32

*Education:* F. EUGENIA WHITEHEAD, Sc.D., Dept. of Home Economics, State Univ. of Iowa, Iowa City

*Food Administration:* MRS. ESTHER G. WOODRUFF, VA Hospital, West Haven 16, Conn.

**Public Relations Chairman**

MRS. DAGMAR TUOMIN WALCH, 1856 No. 71st St., Wauwatosa 13, Wis.

**Council of the House of Delegates**

*Speaker:* EDITH A. JONES, Clinical Center, National Institutes of Health, Bethesda 14, Md.

*Speaker-Elect:* GERTRUDE E. MILLER, Instructor in Dietetics, VA Center, Los Angeles

*Delegates of the House of Delegates*

GLADYS J. EVERSON, Ph.D., Univ. of California, Davis

MIRIAM E. LOWENBERG, Ph.D., The Pennsylvania State Univ., University Park, Pa.

MRS. BEULA B. MARBLE, 131 Laurel Rd., Chestnut Hill, Mass.

*Delegates-at-Large*

VIRGINIA F. HARGER, School of Home Economics, The Ohio State Univ., Columbus 10

LORRAINE G. WENG, Natl. Dairy Council, Chicago 6

MRS. GRACE S. SHUGART, Kansas State Univ., Manhattan

## BOARDS—1959-60

**Advisory Board**

*Chairman:* ALBERT W. SNOKE, M.D., Grace-New Haven Community Hospital, New Haven 4, Conn.

C. A. ELVEHJEM, Ph.D., President, Univ. of Wisconsin, Madison 6

HARRY A. BULLIS, 404 Title Insurance Bldg., Minneapolis 1

**Awards, Scholarship, and Loan Fund Board**

*Chairman:* GLADYS H. ROEHM, Ph.D., Montana State College, Bozeman

MARGARET F. ROSS, Charlotte Memorial Hospital, Charlotte 3, N. Car.

VIRGINIA KOPEC, Dietary Dept., Henry Ford Hospital, Detroit 2

MRS. DOROTHY H. STRONG, Ph.D., Univ. of Wisconsin, Madison 6

GLADYS EVERSON, Ph.D., Univ. of California, Davis

VIRGINIA M. VIVIAN, Ph.D., The Ohio State Univ., Columbus 10

*Ex-officio:* MRS. CORA E. KUSNER,

**Journal Board**

*Chairman:* HELLEN LINKSWILER, Ph.D., Univ. of Nebraska, Lincoln 3

HELEN A. HUNSCHER, Ph.D., Western Reserve Univ., Cleveland 6

MRS. ANSTA BARR, Children's Bureau, 1114 Commerce St.—9th fl., Dallas 2

CALLIE MAE COONS, Ph.D., Human Nutrition Research Div., Institute of Home Economics, U. S. Dept. of Agriculture, Washington 25, D. C.

JANE C. EBBS, Office of QM General, Dept. of Army, Washington 25, D. C.

HAZEL M. HAUCK, Ph.D., N. Y. State College of Home Economics, Cornell Univ., Ithaca

JANE HARTMAN, Conn. Hospital Assn., New Haven 11, Conn.

JANICE M. SMITH, Ph.D., Univ. of Illinois, Urbana

IDA JEAN KAIN, 6696 Glenbrook Rd., Chevy Chase 15, Md.

*Ex-officio:* DORIS JOHNSON, Ph.D., MRS. DOROTHEA F. TURNER, RUTH M. YAKEL, WILMA F. ROBINSON, MRS. MILDRED EGEBERG LEWIS

**Dietetic Internship Board**

*Chairman:* KATHERINE HART, Michigan State Univ., East Lansing

*Ex-officio:* RUTH M. YAKEL, WILMA F. ROBINSON

*Administrative Internship Committee*

*Chairman:* LOUISE ESCH, Hospital Consultant, 26 Overlook Circle, New Rochelle, N. Y.

MARJORIE S. ARKWRIGHT, Illini Union, Univ. of Illinois, Urbana

PATRICIA A. BEEZLEY, Pennant Cafeteria, Topeka, Kans.

*Food Clinic Internship Committee*

*Chairman:* JANE ANDREWS, Food Clinic, Presbyterian Hospital, New York 32

MARGUERITE L. PETTEE, 3242 So. Fairfax St., Denver 22

JEAN CROOKS, 2501 Que St., N. W., Washington 5, D. C.

*Hospital Internship Committee*

*Chairman:* RUTH W. SPENCER, Dietetic Service, Veterans Administration, Atlanta 8

MAJ. MARTHA E. MOSEMAN, AMSC, Fitzsimons Army Hospital, Denver 8

MRS. EVA N. YLVISAKER, Box 1938, Fargo, North Dakota

## COMMITTEES—1959-60

**Nominating Committee**

*Chairman:* ELIZABETH MCCUNE, Univ. of Kansas Medical Center, Kansas City 12

ALICE M. FENNO, School of Business Administration, Harvard Univ., Boston

ABBY L. MARLATT, Ph.D., Univ. of Kentucky, Lexington

RUTH M. KAHN, American Hospital Assn., Chicago 11

PATRICIA BROCKBANK, VA Hospital Seattle

**Membership Committee**

*Chairman:* MARGARET L. ROSS, Ph.D., School of Home Economics, Simmons College, Boston 15

RUTH E. TUCKER, Ph.D., Univ. of Rhode Island, Kingston

MARY ELLEN DAMBOLD, Baylor Univ. Hospital, Dallas 10

GLADYS B. SWENSON, VA Hospital, Portland 7, Ore.

**Finance Committee**

*Chairman:* EVELYN A. CARPENTER, Philadelphia General Hospital, Philadelphia 4

DORIS JOHNSON, Ph.D., Grace-New Haven Community Hospital, New Haven 4, Conn.

EDITH A. JONES, Clinical Center, National Institutes of Health, Bethesda 14, Md.

VIRGINIA F. HARGER, The Ohio State Univ., Columbus 10

LORRAINE G. WENG, Natl. Dairy Council, Chicago 6

*Ex-officio:* MRS. CORA E. KUSNER, MRS. GRACE S. SHUGART

**Public Relations Committee**
*Chairman:* MRS. DAGMAR TUOMIN WALCH, 1856 No. 71st St., Wauwatosa 13, Wis.
*Educational Exhibits Committee*
*Chairman:* M. ELIZABETH VAUGHN, Visiting Nurse Assn., Detroit 1
*Career Guidance Committee*
MRS. FRANCES W. MARGUT, VA Hospital, Lebanon, Pa.

**History of the Association Committee**
*Chairman:* BERTLYN BOSLEY, Ph.D., Div. of Indian Health, U.S. Public Health Service, Washington 25, D. C.
MRS. HARRIET S. W. SWAN, 3109 Oakland Ave., S., Minneapolis 7
HELEN E. WALSH, California Dept. of Public Health, Berkeley 4
MRS. GERALDINE G. GARDINER, 3210 W. DeBazan Ave., St. Petersburg Beach 6, Fla.
*Consultant:* LENNA F. COOPER

**History of Nutrition and Dietetics Committee**
*Chairman:* HELEN A. HUNSCHER, Ph.D., Western Reserve Univ., Cleveland 6
HELEN T. PARSONS, Ph.D., 5724 Old Sauk Rd., Madison 5, Wis.
P. MABEL NELSON, Ph.D., 1829 Santa Ana Ave., Costa Mesa, Calif.
LORRAINE G. WENG, Natl. Dairy Council, Chicago 6

**Committee on International Relations Among Dietitians**
*Chairman:* MARTHA F. TRULSON, Sc.D., School of Public Health, Harvard Univ., Boston 15
MARGUERITE J. QUENEAU, 11 Park Dr., Boston 15
RUTH GORDON, Univ. of Kansas Medical Center, Kansas City 12
DOROTHEA NICHOLL, 10 Montague St., Arlington Heights 74, Mass.
JEAN W. MCNAUGHTON, Regional Office, Food and Agriculture Organization, Washington 25, D. C.
MARY A. ROSS, Food and Agriculture Organization, Rome, Italy

**Constitution Committee**
*Chairman:* MARY ELLEN JOHNSON, Colorado State Hospital, Pueblo
FAYE G. YOUNG, VA Hospital, Atlanta 19
MRS. MARY C. ZAHASKY, Univ. of Oklahoma Medical Center, Oklahoma City 4

**Evaluation Committee for 42nd Annual Meeting**
*Chairman:* GRACE L. SCHOLZ, VA Hospital, Hines, Ill.
MRS. HELEN HAWVER ANDERSON, Palo Alto Hospital, Palo Alto, Calif.
VIRGINIA F. STOKDYK, Conn. Dept. of Health, Hartford 15
HELEN DIEHL, School Lunch Administration, N. Y. State Education Dept., Albany 1
FRANCES E. FISCHER, Western Reserve Univ., Cleveland 6
SHIRLEY SCHULZ, Texas Technological College, Lubbock, Texas

**Program Planning Committee**
*Chairman:* FRANCES E. FISCHER, Western Reserve Univ., Cleveland 6
*Co-Chairman:* RUTH GORDON, Univ. of Kansas Medical Center, Kansas City 12

**Ohio Dietetic Assn. Advisory Committee for 43rd Annual Meeting**
*Chairman:* FRANCES E. FISCHER, Western Reserve Univ., Cleveland
*Co-Chairman:* MARGARET WALSH, The Welfare Federation, Cleveland 15

**Disaster Feeding and Civil Defense Planning Committee**
*Chairman:* AREA III — MRS. VERA THARP, Ill. Dept. of Public Welfare, Springfield
AREA I—MRS. ISABELLE A. HALLAHAN, School Lunch Office, Elmont Road School, Elmont, N.Y.
AREA II—MRS. BETTY M. BRANTLEY, 1708 Sixth St., Lake Charles, La.
AREA II—DOROTHY BOVEE, American Red Cross, Natl. Headquarters, Washington, D. C.
AREA IV—MAJ. KATHARINE E. MANCHESTER, AMSC, Brook Army Medical Center, Ft. Sam Houston, Texas
AREA IV—MRS. JUNE FOSS, 811 Westmoor Dr., Sioux Falls, S. Dak.
AREA V—MRS. ELSIE WELLS RUSSELL, Los Angeles City Health Dept., Los Angeles 12, Calif.

**Library Committee**
*Chairman:* MARY JULIA KRAMPER, 211 E. Delaware Pl., Chicago 11
ELAINE PETROWITZ, Chicago Wesley Memorial Hospital, Chicago 11
*Ex-officio:* DOROTHY J. BATES

**Committee on Diet for the Treatment of Gastro-Intestinal Disorders**
DORIS JOHNSON, Ph.D., Grace-New Haven Community Hospital, New Haven 4, Conn.
MRS. ELIZABETH K. CASO, 248 Moss Hill Rd., Jamaica Plain, Mass.
*Ex-officio:* MRS. DOROTHEA F. TURNER

**Committee to Study Hospital and Institutional Food Service Situations Not under the Management of a Professionally Qualified Dietitian**
*Chairman:* MRS. BEULA B. MARBLE, 131 Laurel Rd., Chestnut Hill 67, Mass.
MRS. WINTRESS D. MURRAY, Eastman Kodak Co., Rochester 4, N. Y.
MRS. CORA E. KUSNER, Colorado State Hospital, Pueblo
ELIZABETH PERRY, Tudor Arms Hotel, Cleveland 6
LOUISE CHRISTENSEN, 801 Hilgard Ave., Los Angeles 24
ELIZABETH KAISER, Men's Graduate Center Dining Halls, Duke Univ., Durham, N. Car.

**Committee on the Future Development of the Association**
*Chairman:* LUCILLE M. REFSHAUGE, Hartford Hospital, Hartford 15, Conn.
HELEN A. HUNSCHER, Ph.D., Western Reserve Univ., Cleveland 6
AIMEE N. MOORE, Ph.D., N.Y. State College of Home Economics, Cornell Univ., Ithaca
GERALDINE M. PIPER, Chronic Disease Program, U. S. Public Health Service, Washington 25, D. C.
J. JUNE STEIN, Washington State Health Dept., Seattle 4

**Committee to Review and Revise the Objectives for Section Activities**
*Chairman:* LORRAINE G. WENG, Natl. Dairy Council, Chicago 6
J. JUNE STEIN, Washington State Health Dept., Seattle 4
DOROTHY M. KINNEAR, Columbia-Presbyterian Medical Center, New York 32
F. EUGENIA WHITEHEAD, Sc.D., State Univ. of Iowa, Iowa City
MRS. ESTHER G. WOODRUFF, VA Hospital, West Haven 16, Conn.

**Committee on Professional Cooperation with Nutrition Workers and Libraries in Other Countries**
*Chairman:* HELEN GER OLSON, Div. of Indian Health, U. S. Public Health Service, Washington 25, D. C.

**Continuing Education Regional Representatives**
*Region I—Alaska, California, Hawaii, Idaho, Nevada, Oregon, Washington:* ELSIE L. BAKKEN, 6815 N. E. 134th St., Kirkland, Wash.

*Region II—Montana, Nebraska, North Dakota, South Dakota, Wyoming:* MARJORIE MORRISON, U. S. Children's Bureau, 621–17th St., Denver 2; *Co-Representative* — RUTH FRAHM, 540 No. 16th St., Lincoln 8, Neb.

*Region III—Arizona, Colorado, Kansas, New Mexico, Oklahoma, Texas, Utah:* MARY ELLEN JOHNSON, Colorado State Hospital, Pueblo; *Co-Representative*—MRS. DOROTHY D. HUTCHINSON, St. Luke's Hospital, Denver 3

*Region IV—Illinois, Iowa, Michigan, Minnesota, Missouri, Wisconsin:* GRACE L. SCHOLZ, VA Hospital, Hines, Ill.; *Co-Representative* — KATHERINE HART, Michigan State Univ., East Lansing

*Region V—Alabama, Florida, Georgia, Louisiana, Mississippi, Puerto Rico, South Carolina:* MRS. MARY GERALDINE GETTY, Arkansas Bd. of Health, Little Rock; *Co-Representative*—SISTER JOSEPH MARIE, C. S. J., St. Joseph's Hospital, Augusta, Georgia

*Region VI — Delaware, Kentucky, Maryland, North Carolina, Tennessee, Virginia, West Virginia, Washington, D. C.:* GERALDINE M. PIPER, Chronic Disease Program, U. S. Public Health Service, Washington 25, D. C.

*Region VII — Indiana, New Jersey, New York, Ohio, Pennsylvania:* MRS. REGINA G. FRISBIE, Kellogg Co., Battle Creek, Mich.

*Region VIII—Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont:* HARRIET J. WRIGHT, Univ. of Massachusetts, Amherst; *Co-Representative*—NATALIE GIGLIO, Grace-New Haven Community Hospital, New Haven 4, Conn.

*Advisors:* F. EUGENIA WHITEHEAD, Sc.D., and R. BRUCE KIRK, Ph.D.

## JOINT COMMITTEES—1959-60

**American Hospital Association—A.D.A.**
*Chairman:* LUCILLE M. REFSHAUGE, Hartford Hospital, Hartford 15, Conn.
MRS. MARY C. ZAHASKY, Univ. of Oklahoma Medical Center, Oklahoma City 4
MRS. HENRIETTE GEBERT, Passavant Hospital, Chicago 11
MYRTLE VAN HORNE, The American Dietetic Assn., Chicago 11

**National League of Nursing—A.D.A.**
*Chairman:* LUCILLE M. REFSHAUGE, Hartford Hospital, Hartford 15, Conn.
A. ELIZABETH CROZIER, Univ. of Rochester School of Medicine & Dentistry, Rochester 20, N. Y.
JESSIE C. GREENE, 67 Overlook Rd., Marblehead, Mass.
MARY E. KELLY, Medical College of Virginia, Richmond

**Food and Nutrition Board**
MRS. DOROTHEA F. TURNER, Editor, Journal of The American Dietetic Assn., 620 No. Michigan Ave., Chicago 11

**Council of American Association for Advancement of Science**
DOROTHY R. JUTTON, Univ. of Wisconsin, Madison 6

**National Health Council**
*Delegates*
MRS. NELDA ROSS LARSSON, 160 Cabrini Blvd., New York 33
LUCILLE M. REFSHAUGE, Hartford Hospital, Hartford 15, Conn.
MARY REEVES, Children's Bureau, 433 W. Van Buren St., Chicago
*Committee on State and Local Councils:* VIRGINIA F. STOKDYK, Conn. Dept. of Health, Hartford 15
GERALDINE M. PIPER, Chronic Disease Program. U. S. Public Health Service, Washington 25, D. C.

**American Medical Association—A.D.A.**
*Chairman:* DORIS JOHNSON, Ph.D., Grace-New Haven Community Hospital, New Haven 4, Conn.
MRS. DOROTHEA F. TURNER, The American Dietetic Assn., Chicago 11
*Ex-officio:* RUTH M. YAKEL

**Advisory Committee on School Lunch**
BEATRICE DONALDSON, Ph.D., School on Home Economics, Univ. of Wisconsin, Madison 6

**Committee on Equipment Development, American Gas Association—A.D.A.**
*Chairman:* ARLENE WILSON, Indiana Dept. of Health, Indianapolis 7
MRS. HENRIETTE GEBERT, Passavant Hospital, Chicago 11

## REPRESENTATIVES—1959-60

*Committee on Health Education:* A. JUNE BRICKER, Metropolitan Life Insurance Co., New York 10

**Sub-Committee on Educational Qualifications of Nutritionists in Public Health, American Public Health Association**
MRS. ALICE H. SMITH, Hillcrest Village, 531 Glenmore, East Lansing, Michigan

**National Project in Agricultural Communication**
*Steering Committee:* E. NEIGE TODHUNTER, Ph.D., Univ. of Alabama, University
*Sub-Committee on Preparation for Communications:* ABBY L. MARLATT, Ph.D., Univ. of Kentucky, Lexington
RUTH M. YAKEL, The American Dietetic Assn., Chicago 11

**Committee on Rehabilitation, American Home Economics Association**
*Chairman:* RUTH A. REAMS, VA Hospital, Brooklyn 9
BETSY D. HELBURN, Union Health Center, New York 1
PAULINE MURRAH, Hunter College, New York 21
NELLE M. SAILOR, Visiting Nurse Service of New York, New York 21
ENEZ M. BEZ, Fordham Hospital, Bronx, New York

**Mental Hospital Service, American Psychiatric Association—A.D.A.**
*Chairman:* MRS. KATHERINE E. FLACK, N. Y. State Dept. of Mental Hygiene, Albany
MRS. MARGARET C. MADDEN, Philadelphia Psychiatric Hospital, Philadelphia 31

*Sub-Committee on Promotion with Emphasis on Recruitment:* LEVELLE WOOD, The Ohio State Univ., Columbus 10
*Sub-Committee on Research on Home Economics Communications:* A. JUNE BRICKER, Metropolitan Life Insurance Co., New York 10
*Sub-Committee on Dissemination of Home Economics Information:* HELEN MITCHELL, Ph.D., Univ. of Massachusetts, Amherst

**Policy Committee, National Citizens Committee of WHO**
MARY T. MCINERNEY, Div. of Medical Services, N. Y. State Dept. of Health, Albany 8

**National Advisory Committee on Emergency Feeding**
MRS. VERA THARP, Ill. Dept. of Public Welfare, Springfield

## PRESIDENTS OF STATE DIETETIC ASSOCIATIONS AFFILIATED WITH THE AMERICAN DIETETIC ASSOCIATION

ALABAMA: Bettie W. Lewis, VA Hospital, Montgomery
ALASKA: Mrs. Amelia E. Snell, U.S. Public Health Service, Anchorage
ARIZONA: Mrs. Louise G. Kennedy, St. Luke's Hospital, Phoenix
ARKANSAS: Mrs. Ada B. Green, 4623 W. 11th St., Little Rock
CALIFORNIA: Mrs. Jane S. Pirkey, 3221 Mountain View Ave., Sacramento 21
COLORADO: Mrs. Ada E. Bragg, Colorado State Hospital, Pueblo
CONNECTICUT: Mrs. Mary J. Manko, VA Hospital, West Haven 16
DELAWARE: Dorothy H. Hartman, St. Francis Hospital, Wilmington 5
DISTRICT OF COLUMBIA: Mrs. Helen R. Cahill, Veterans Administration Central Office, Washington 25
FLORIDA: Mrs. Joan J. Coleman, Ph.D., Florida State Univ., Tallahassee
GEORGIA: Capt. Caroline Fanning, AMSC, Martin Army Hospital, Fort Benning
HAWAII: Nobuko Shiraki, Kuakini Hospital, Honolulu
IDAHO: Alice L. Henry, Box 972, Gooding
ILLINOIS: Marjorie S. Arkwright, Illini Union, Univ. of Illinois, Urbana
INDIANA: Maxine F. Wilson, Purdue Univ., Lafayette
IOWA: Grace M. Augustine, Ph.D., Iowa State College, Ames
KANSAS: Elizabeth McCune, Univ. of Kansas Medical Center, Kansas City 12
KENTUCKY: Mrs. E. Mary Lou Vaughn, 3512 Kerry Dr., Louisville 18
LOUISIANA: Mrs. Shirley L. Smith, Lafayette Sanitarium, Lafayette
MAINE: Mrs. Florence P. Hansen, Nasson College, Springvale
MARYLAND: Dorothy E. Michel, Friends School, Baltimore 10
MASSACHUSETTS: Madge L. Myers, Peter Bent Brigham Hospital, Boston 15
MICHIGAN: Mrs. Rose B. Anthony, 1015 Detroit St., Flint 4
MINNESOTA: Florence C. Schmidt, St. Marys Hospital, Rochester
MISSISSIPPI: Ernestine I. Frazier, Ph.D., Mississippi Southern College, Hattiesburg
MISSOURI: Mrs. Helen F. Starch, Barnes Hospital, St. Louis 10
MONTANA: Mrs. Marie R. Sopp, Deaconess Hospital, Billings
NEBRASKA: Mrs. Mary Carey, Dairy Council of Lincoln, Lincoln
NEVADA: Mrs. Jo Beth Adamson, Southern Nevada Memorial Hospital, Las Vegas
NEW HAMPSHIRE: Mrs. Elizabeth T. Winslow, South Main St., West Franklin
NEW JERSEY: Mrs. Marie C. Abromaitis, 118 S. Grove St., East Orange
NEW MEXICO: Lenora G. Weber, VA Hospital, Albuquerque
NEW YORK: Margaret Grainey, Genesee Hospital, Rochester 7
NORTH CAROLINA: C. Winston Osborn, Guilford County Health Dept., Greensboro
NORTH DAKOTA: Beverly J. Thorstenson, VA Hospital, Fargo
OHIO: Frances E. Fischer, Western Reserve Univ., Cleveland 6
OKLAHOMA: Mrs. Agnes W. Silvey, Oklahoma Natural Gas Co., Okmulgee
OREGON: Robert A. Smith, Univ. of Oregon, Eugene
PENNSYLVANIA: Mabel I. Pluemacher, Bucknell Univ., Lewisburg
PUERTO RICO: Mrs. Maria V. Cruz de Lara, Dept. of Health, Santurce
RHODE ISLAND: Ruth E. Tucker, Ph.D., Univ. of Rhode Island, Kingston
SOUTH CAROLINA: Mrs. Katherine C. Vaughan, 1416 E. Muller Ave., Columbia 3
SOUTH DAKOTA: Frances M. Hettler, South Dakota State College, Brookings
TENNESSEE: Moiselle Peay, Baptist Hospital, Nashville 3
TEXAS: Margaret A. Eppright, Ph.D., Univ. of Texas, Austin 12
UTAH: Mrs. Margaret G. Gere, 2618 Wellington St., Salt Lake City 6
VERMONT: Margery Vaughn, Vermont Dairy Council, Montpelier
VIRGINIA: Mrs. Edna C. Evans, Federal Reserve Bank, Richmond
WASHINGTON: Monica R. Roller, 3726 South "K" St., Tacoma 8
WEST VIRGINIA: Mrs. Katherine D. Spencer, Beckley Memorial Hospital, Beckley
WISCONSIN: Frances P. Kelley, VA Center, Wood
WYOMING: Mrs. Elaine L. Avery, Memorial Hospital, Sheridan

**THE BEST FOOD DESERVES THE FINEST CRACKER**

PREMIUM SALTINE CRACKERS*
with NEW GOLDEN GLOW

Your customers will appreciate these finer saltine crackers. They're tastier, flakier and snapping crisp. These top-quality crackers are always perfect in our moistureproof cellophane packets.

**Premium Snow Flake Saltine Crackers in the Pacific States*

**SEND FOR FREE BOOKLET AND SAMPLES**

National Biscuit Co., Dept. 2-
425 Park Avenue, New York 22, N. Y.

Name .....

Firm .....

Address .....

City .....

®

*in the peptic ulcer diet...*

**"orange juice several times daily"** *

**affords protection against vitamin C deficiency without untoward effects on ulcer healing**

*

Strub, Talso, and ValDez, in studying gastric response to orange juice, find that when patients with active duodenal ulcers are given 4 oz. orange juice "several times daily" along with "the usual forms of medical management, no prolongation in the healing is noted." (J.A.M.A. 163:1602, 1957)

# with Toastmaster hot-food servers every patient is assured delicious hot meals!

**Mobile Toastmaster Hot-Food Servers with precisely controlled temperature and humidity protect food for hours!**

How pleased your patients will be when *every* meal arrives piping-hot and fresh! *You'll* be pleased, too, when you add up the savings in food, time and labor!

More and more leading hospitals are finding that mobile Toastmaster Hot-Food Servers provide the utmost in quality and portion control. Complete plates of hot food can now be assembled in the central kitchen—under the supervision of the dietitian—loaded into the convenient Hot-Food Server drawers, and wheeled to the floors for easy serving. This efficient food service assures hot meals that are oven-fresh in flavor and appearance. It also eliminates call backs, and provides an accurate count of hospital meals. And equally important—only the amount of food that is to be served is prepared, thus reducing waste!

A unique system of six-sided air circulation and adjustable humidity controls for each drawer, plus an exacting Robertshaw thermostat, keeps crisp foods crisp and moist foods soft. Gleaming stainless-steel exteriors and drawers, for complete sanitation. No installation expense—operates on any standard 115-volt circuit.

Ask your food service equipment dealer to show you how mobile Toastmaster Hot-Food Servers can speed up service and reduce cost. Call him today!

Model 3D2-C 4-drawer mobile
Holds 32 plates of hot food.

**The Complete Line of ELECTRIC Cooking Equipment**

**TOASTMASTER®**

"TOASTMASTER" is a registered trademark of McGraw-Edison Company, Elgin, Ill.

McGRAW EDISON

TOASTERS · SANDWICH GRILLS · BROILERS
BUN TOASTERS · FRY KETTLES · GRIDDLES
GRILLS · HOT-FOOD SERVERS · HOT PLATES
BUILT-IN COUNTER EQUIPMENT · OVENS
PIZZA OVENS · RANGES · WAFFLE BAKERS
FOOD WARMERS · SINK SANITIZERS · BLENDERS

# *A well-balanced moderate low-fat breakfast for teen-age girls, 16-19 years*

When a moderate reduction of dietary fat is indicated for girls in their late teens, the basic cereal and milk breakfast merits consideration. *This breakfast is moderately low in fat because its fat content of 10.9 gm. provides 20 per cent of the total calories.* As shown in the table below, it contributes *well-balanced nourishment.* It provides "Girls, 16 to 19 Years" with approximately one-fourth of the recommended dietary allowances[1] of complete protein, important B vitamins, essential minerals; and provides quick and lasting energy.

*recommended dietary allowances* and the nutritional contribution of a moderate low-fat breakfast*

*Menu: Orange Juice—4 oz.;*
*Cereal, dry weight—1 oz.;*
*Whole Milk—4 oz.; Sugar—1 teaspoon;*
*Toast (white, enriched)—2 slices;*
*Butter—5 gm. (about 1 teaspoon);*
*Nonfat Milk—8 oz.*

| Nutrients | Calories | Protein | Calcium | Iron | Vitamin A | Thiamine | Riboflavin | Niacin equiv. | Ascorbic Acid |
|---|---|---|---|---|---|---|---|---|---|
| Totals supplied by Basic Breakfast** | 503 | 20.9 gm. | 0.532 gm. | 2.7 mg. | 588 I.U. | 0.46 mg. | 0.80 mg. | 7.36 mg. | 65.5 mg. |
| Recommended Dietary[1] Allowances—Girls, 16 to 19 Years (54 kg.—120 lb.) | 2400 | 75 gm. | 1.3 gm. | 15 mg. | 5000 I.U. | 1.2 mg. | 1.9 mg. | 16 mg. | 80 mg. |
| Percentage Contributed by Basic Breakfast | 20.9% | 27.9% | 40.9% | 18.0% | 11.8% | 38.3% | 42.1% | 46.0% | 81.9% |

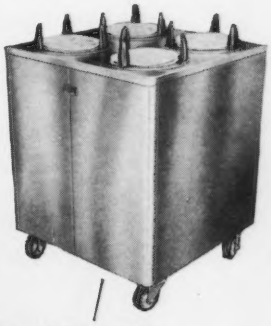
**Revised 1958. Food and Nutrition Board, National Research Council, Washington, D.C.*

***Cereal Institute, Inc.: Breakfast Source Book. Chicago: Cereal Institute, Inc., 1959.*
*Watt, B. K., and Merrill, A. L.: Composition of Foods—Raw, Processed, Prepared. U.S.D.A. Agriculture Handbook No. 8, 1950.*

[1]*The allowance levels are intended to cover individual variations among most normal persons as they live in the United States under usual environmental stresses. Calorie allowances apply to individuals usually engaged in moderate physical activity. For office workers or others in sedentary occupations they are excessive. Adjustments must be made for variations in body size, age, physical activity, and environmental temperature.*

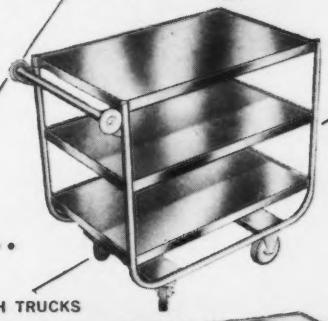
CEREAL INSTITUTE, INC.
135 South La Salle Street, Chicago 3
*A research and educational endeavor devoted to the betterment of national nutrition*

MEALMOBILE
MODEL 9020-BCT



DISH LIFTERS

TRAY LIFTERS

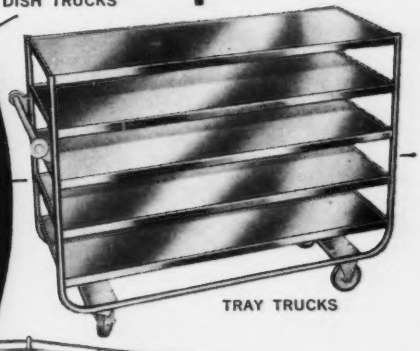


DISH TRUCKS

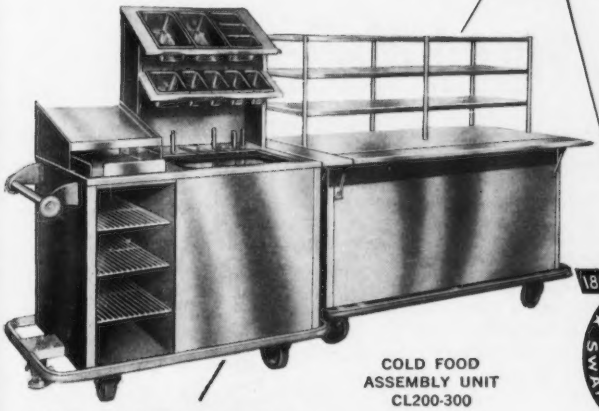
## *For a Centralized food Service System...*

The Swartzbaugh Company now offers you a complete centralized food serving system to meet all requirements, large or small. Modular design of the IDEAL centralized system makes it possible to expand your food service system without interfering with your overall kitchen operation. By systematizing your food service, you increase the number of patients served within a given time, and this added efficiency helps reduce costs. And you also gain the important advantage of serving the patient a good palatable, appetizing meal.

**Only *Ideal*® offers ALL the equipment you need**



TRAY TRUCKS



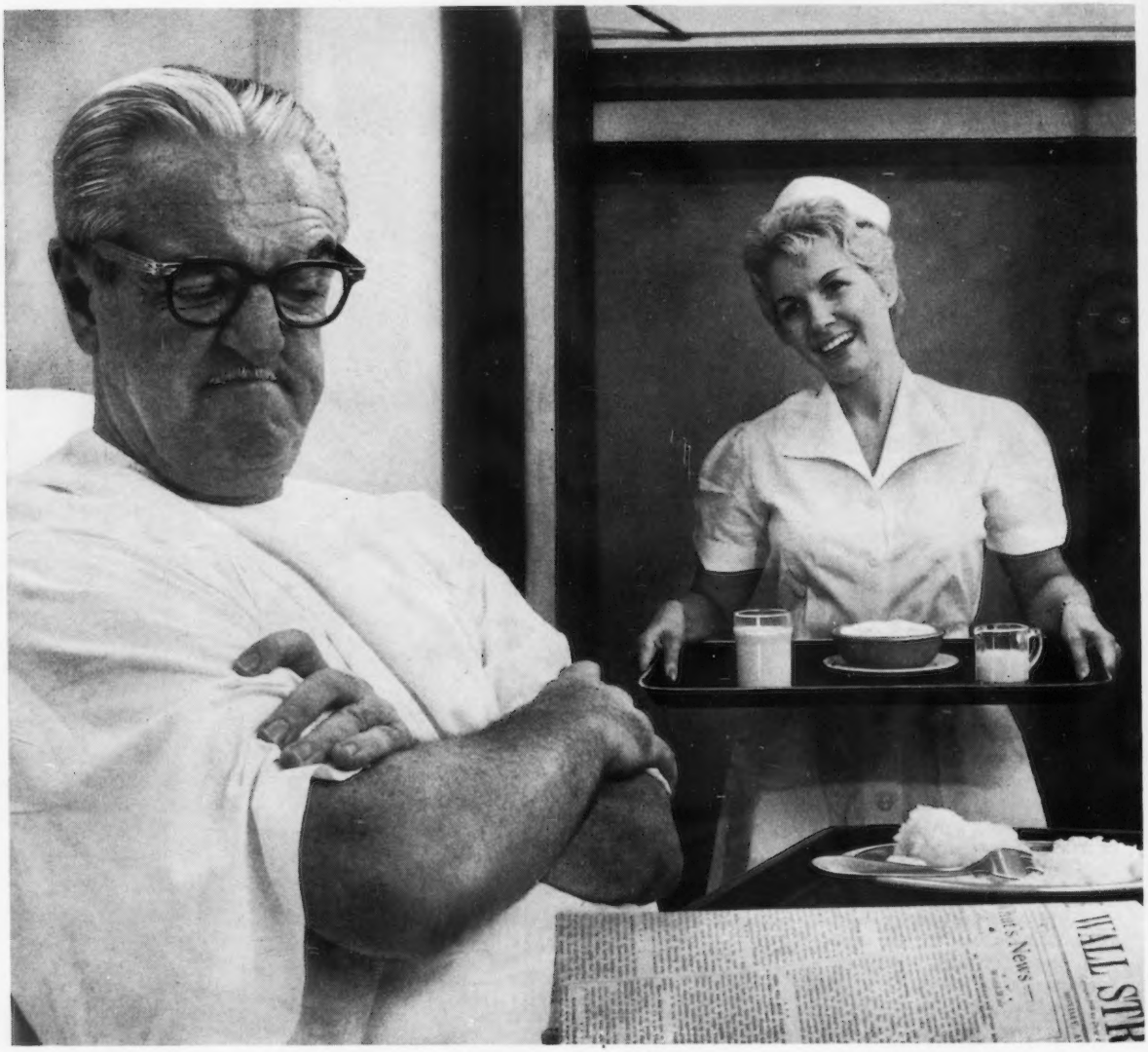
COLD FOOD
ASSEMBLY UNIT
CL200-300

HOT FOOD
ASSEMBLY UNIT
FS-100

1884 *Ideal* 1959
75 YEARS
SWARTZBAUGH MFG. CO.

***Write for full information***

**SWARTZBAUGH MANUFACTURING CO. • Murfreesboro, Tenn.**



*If he refuses "tasteless baby food"...*

# serve him double-flavored Malt-o-Meal

Here's a man used to getting exactly what he wants. Bland diet? Let's face it . . . he hates it. So give him something bland but full of flavor—*double-flavored* Malt-o-Meal. Sun-ripened wheat and toasted malt. Never gummy—has good "mouth feel." It's just what the doctor ordered for bland diets, geriatric patients, and baby. And it's just good eating.

REMEMBER THIS ABOUT MALT-O-MEAL

- No sodium added. Natural content 3 mg. per 100 gms.
- Low-Fiber Content (½%) truly non-irritating, chemically and mechanically.
- Easily digestible.
- Fortified with B complex vitamins and iron.
- Low fat—no cholesterol.
- Free of non-nutritional additives.
- Added wheat gluten gives higher protein content.

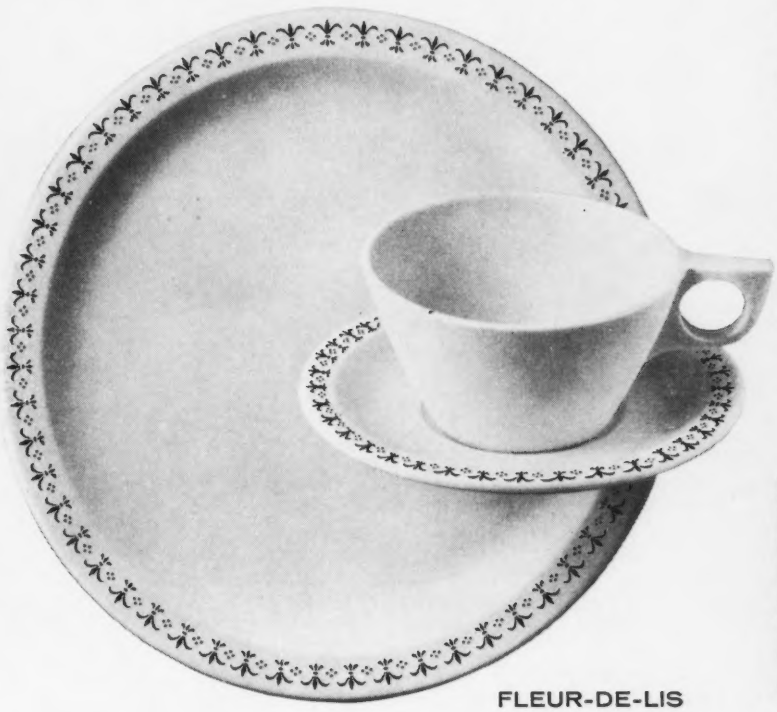
*When ordering cereal . . . order Malt-o-Meal enriched wheat cereal*

(MEETS FEDERAL SPECIFICATION FOR ENRICHED WHEAT CEREAL)

# NEW PATTERNS

*in the finest quality melamine dinnerware*

# REGAL DECORATED



FLEUR-DE-LIS

Seven new patterns, all as beautiful and food-flattering as the popular "Fleur De-Lis," join the REGAL DECORATED family. Molded to PMC's exclusive high standards, REGAL DECORATED offers quality and craftsmanship that can cut your replacement costs up to 80% every year. All pieces handle easily and stack perfectly in a minimum of space. An exclusive contour foot provides complete drainage and fast drying. See the new PMC patterns, including a new decorated coupe shape, at your dealer or write us for information.

PLASTICS MANUFACTURING COMPANY

2700 S. Westmoreland Ave., Dallas 33, Texas

*For quality and craftsmanship* — choose

REGAL DECORATED • DALLAS WARE • TEXAS WARE

GEORGIAN ELKS' AIDMORE CHILDREN'S CONVALESCENT HOSPITAL

One of the finest examples of Elk benevolence is the Aidmore Children's Convalescent Hospital in Atlanta, Georgia. Its purpose is the rehabilitation of Georgia's handicapped children coming from families not financially able to bear the cost of necessary treatment and not eligible for assistance under other existing programs.

The modern sixty-four bed hospital is located among beautiful, pillared pines, a setting which in itself is an aid to convalescence. Aidmore provides nursing care, dietary treatment and physical medicine treatment that includes physical therapy, speech therapy and a medically supervised recreation program.

PMC molded dinnerware was installed at Aidmore in 1954. Since then, losses due to breakage have dropped to only 8% a year, a savings easily put to work elsewhere in the hospital.

PMC will be happy to plan an installation for your hospital, estimating the original cost and yearly replacement savings you can expect. Just fill in and mail the coupon. No obligation of course.

Number of meals served a day_____

*Name*_____

*Hospital*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

MAIL TO: N. W. Beech, Commercial Ware Division, Plastics Manufacturing Company, Dept. JAD-1259, 2700 South Westmoreland Avenue, Dallas 33, Texas.

*Finest coffee from many lands*
*custom blended by Sexton*

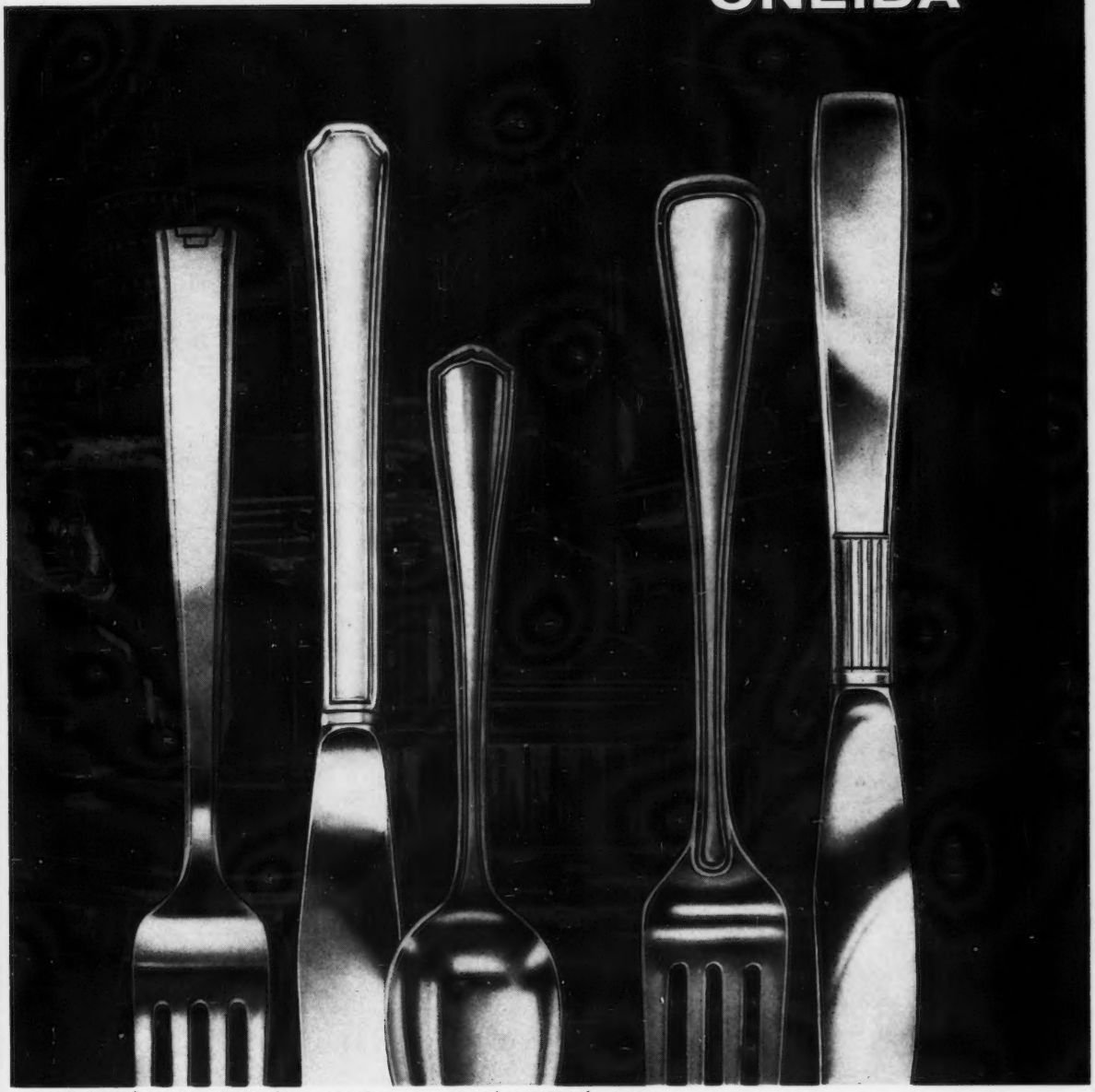
Serving Sexton custom blended coffee is a sure way to make your food service known far and wide. Packed in flavor sealed packages, in sizes designed for all coffee services.

Sexton
Quality Foods

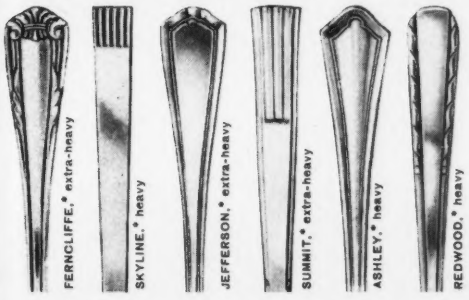
JOHN SEXTON & CO., CHICAGO
LONG ISLAND CITY • SAN FRANCISCO
PHILADELPHIA • BOSTON
PITTSBURGH • DALLAS • ATLANTA
DETROIT • INDIANAPOLIS

*Nothing finer the world over...*

**SILVERPLATE BY ONEIDA**



Left to right: AZTEC,* extra-heavy; SENECA,* heavy; ETON,* extra-heavy; REGIS,* COLEBROOK,* both heavy.




Watch your patrons respond to the gracious warmth that silver alone can give. And when it's Silverplate by Oneida, you can be sure you're getting the finest quality for your money: beautiful patterns, proper weight, balance, exclusive balanced plating, costliest finishing operations. Choose this longer-lasting tableware designed and priced to suit your needs.

*See your food equipment dealer or write to:*
HOTEL AND RESTAURANT DIVISION
ONEIDA SILVERSMITHS ONEIDA, NEW YORK

*Creators of fine tableware:* Oneida* Ltd. Silversmiths, Oneida* Ltd., Oneida* Hotel Plate, Wm. A. Rogers* Hotel Plate
*TRADEMARKS OF ONEIDA LTD.

● THIS MESSAGE CONCERNS THE COLOR CHART OPPOSITE. PLEASE READ THIS PAGE FIRST

# *Roche invites you to participate in the expanded* Roche Beta CAROTENE *educational program*

At right is a sample of the large color chart which Roche has published for distribution to dietitians, home economists, teachers, students, and all others interested in nutrition.

This colorful poster is the latest creative effort in the continuing program of education in the values of pure, safe beta carotene which Roche is conducting.

Beta carotene is an important ingredient in foods. It is safe. It provides true color. Because it is provitamin A it has nutritional value. It is the *only* color that nourishes. We believe it in the public interest that these facts be widely known.

Used in many different foods, Beta Carotene Roche gives them color (ranging from pale yellow to deep orange) and nutritional value. Some of these foods are:

**Margarine**
**Salad and Cooking Oils**
**Mellorine • Ice Cream Products**
**Pie Crust and Cake Mixes**
**Shortening • Baked Goods**
**Fruit Drinks, Fruit Juices and Concentrates**
**Puddings and Egg Yolk Products**
**Frozen Foods**
**Gelatin Desserts • Confections**
**Dessert Toppings • Popcorn**
**Cheese • Soups • Creamed Foods**

**YOURS TO USE.** Copies of the colorful beta carotene chart will be supplied for your own educational program or other use — without cost of course.

Also available is a unique demonstration kit which allows you to show the extraordinary coloring properties of beta carotene in the classroom, at lectures, and elsewhere.

"The Story of Nature's Yellow," an attractive brochure, written in nontechnical language yet filled with interesting and completely authentic information about beta carotene, could also be useful to you.

We'll be pleased to cooperate with you by supplying reasonable quantities of this material. Just send your request, specifying what you need, to the Department of Education at the address below. You are not obligated in any way.

**Vitamins Come RIGHT From Roche**

VITAMIN DIVISION

**HOFFMANN-LA ROCHE INC.**

NUTLEY 10, N. J.

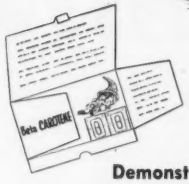
NOrth 7-5000 • New York City: OXford 5-1400

*In Canada:* Hoffmann-La Roche Ltd., 1956 Bourdon Street St. Laurent, Montreal 9, P.Q.

## YOURS TO USE

Four-color poster 14" x 21"

Interesting, informative Brochure




Demonstration Kit

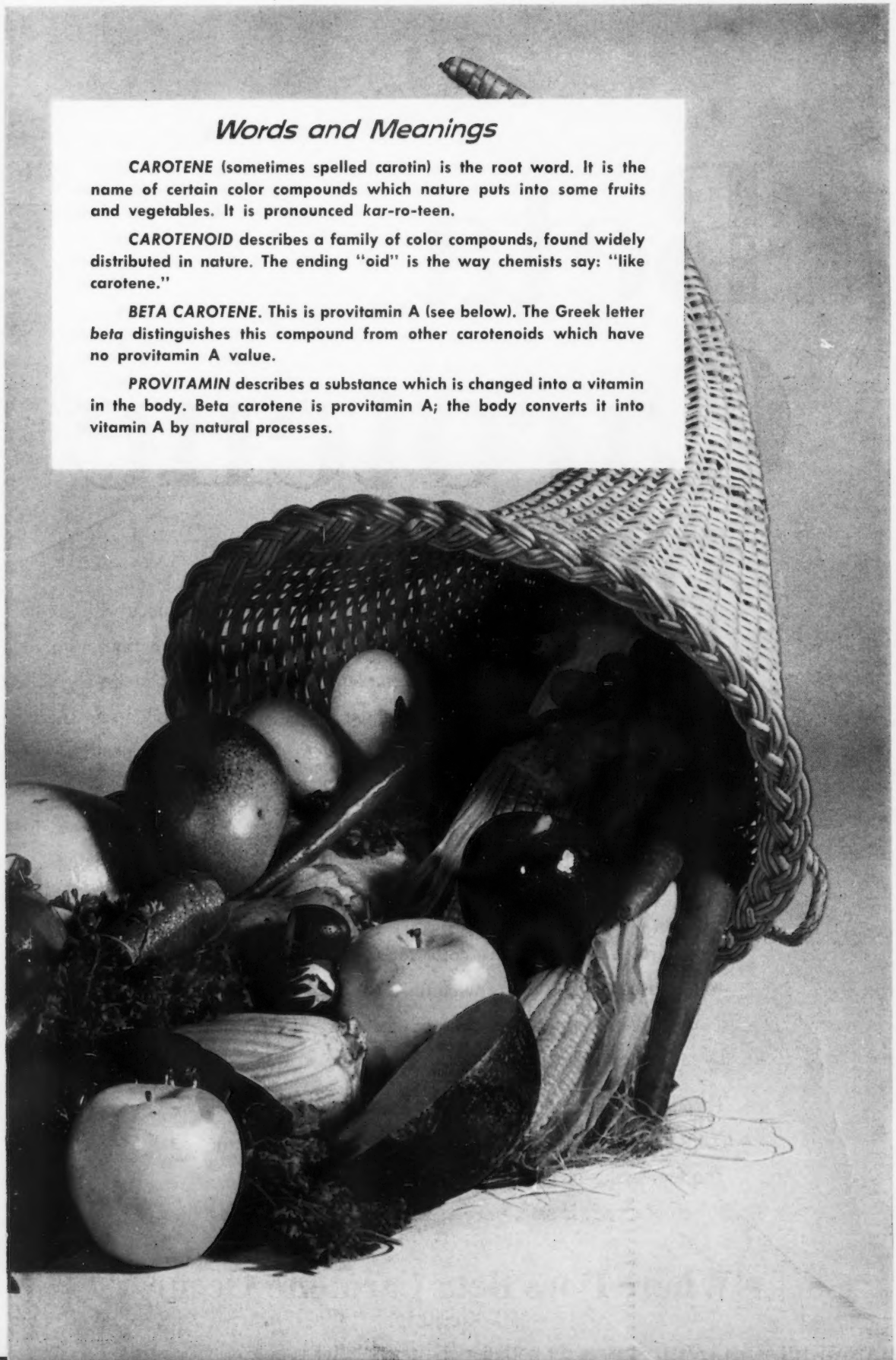
P.S. If you're the one who removes the color chart from the magazine, just put your initials here_____ so your associates will know where to look for it. Better still, why not see that all interested people in your organization have a copy of the poster. We'll be glad to send as many as you need.

*What You Should Know About*

# Nature's Yellow –

# BETA CAROTENE

5-1400



## *Words and Meanings*

***CAROTENE*** **(sometimes spelled carotin) is the root word. It is the name of certain color compounds which nature puts into some fruits and vegetables. It is pronounced *kar*-ro-teen.**

***CAROTENOID*** **describes a family of color compounds, found widely distributed in nature. The ending "oid" is the way chemists say: "like carotene."**

***BETA CAROTENE.*** **This is provitamin A (see below). The Greek letter *beta* distinguishes this compound from other carotenoids which have no provitamin A value.**

***PROVITAMIN*** **describes a substance which is changed into a vitamin in the body. Beta carotene is provitamin A; the body converts it into vitamin A by natural processes.**

# Beta Caroten

Attractive color adds appetite appeal as well as eye appeal to the foods we eat. Careful selection of color contrast, or the complementing of these colors, is one of the basic standards of good meal planning. Colorful food helps to make eating an exciting adventure.

How fortunate we are that nature provides

## • What Is Beta Carotene?

Beta carotene is a nutritive color found in many widely used foods. It is provitamin A—
a substance which the healthy body converts to vitami
by natural processes.

Through scientific research, man successfully and economically duplicated the beta carotene found in nat
The food industry makes extensive use of this valuable color because it is safe, pure and nutritious.

## • Where Does Beta Carotene O

Carrots, corn, sweet potatoes and many other yellow

# The Color That Nourish

# ene

l as elec- g of s of s to ides

many foods with a color that is both appetizing and nutritious. For example, carrots, corn, sweet potatoes, egg yolks, citrus fruits and many other foods contain beta carotene which supplies an appealing yellow-orange color plus important vitamin A value.

On the other hand, many beneficial foods are

less att a sourc cepted to use foods t vide a appeal

## e?

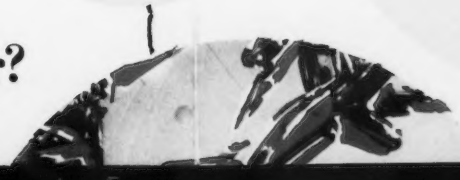
many

rts to vitamin A

lly and found in nature. this valuable s.

## tene Occur?

her yellow



*

# The Color That Nourishes

# ene

well as
l selec-
nting of
ards of
elps to

rovides

## ne?

in many

verts to vitamin A

sfully and
ne found in nature.
of this valuable
ious.

## otene Occur?

other yellow

many foods with a color that is both appetizing and nutritious. For example, carrots, corn, sweet potatoes, egg yolks, citrus fruits and many other foods contain beta carotene which supplies an appealing yellow-orange color plus important vitamin A value.

On the other hand, many beneficial foods are less attractively colored, or may be deficient as a source of vitamin A. Thus, it is a widely accepted practice for commercial food processors to use man-made beta carotene in some of these foods to make them more attractive and to provide a nutrition bonus as well as increased eye appeal to good foods.

*

colored foods are excellent sources of natural beta carotene. It is also found in leafy vegetables although the green of the chlorophyll frequently masks the carotene color. Pure beta carotene is a deep violet-red, becoming yellow to yellow-orange when diluted.

There are many other carotenoids but beta carotene is the only one that provides significant vitamin A activity.

## • Beta Carotene in Our Daily Diet

Beta carotene is found in so many foods that it accounts for a large portion of our vitamin A intake. Therefore, it is important to eat adequate amounts of colorful vegetables and fruits as well as those processed foods which are improved with beta carotene; for example, margarine, yellow shortening, salad oils, processed cheese, and a variety of baked goods, beverages and confections.

At present, man-made beta carotene is widely used by commercial food processors, but it is not yet available for addition to foods prepared in the home.

* *Crystals of pure beta carotene magnified many thousands of times as seen through a microscope. When used by food processors these crystals are either dissolved in edible oil or dispersed in water.*

**Beta**

Text as appeared in What's New In Home

**Beta CAROTENE in your daily diet**

What's New In Home Economics, September, 1959.

## The Safe, Pure Color

Beta carotene, one of nature's own colors, is found in a wide variety of foods which we eat every day.

Man has duplicated nature's beta carotene so that both have exactly the same properties — safety, purity, attractive color, nutritional value. Food processors use beta carotene to give safe, pleasing color and nutritional value to many foods and beverages.

## The Safe, Pure Color With Nutritional Value

Because it is provitamin A (see Words & Meanings), beta carotene also provides essential nutritional value. Therefore, for good health, we should eat vegetables and fruits as well as processed foods which contain beta carotene.

## Why We Must Have Vitamin A

Vitamin A is necessary to guard the health of our eyes, our skin and other parts of our body. It builds resistance against infections and protects against night blindness. Vitamin A promotes normal growth from infancy to maturity.

### Read Your Food Package Labels

Many processors use beta carotene to make their good foods more appetizing, appealing and nutritious. Thus, you will see on food packages: "Colored with beta carotene (provitamin A)." This statement means that these products have been safely colored with nutritious beta carotene.

FREE Demonstration Kit, Brochure, and Color Charts.
Write Department of Education,
Vitamin Division, Hoffmann-La Roche Inc.,
Nutley 10, New Jersey —
the sponsors of this program.

Advertisement

# Diamond Crystal Packets

## SAVE TIME, MONEY AND LABOR

Why lose time washing, refilling and serving salt, pepper and sugar in old-fashioned, breakable dispensers? Why not use modern, labor-saving, sanitary Diamond Crystal Seasoning Packets?

You can speed up service at peak periods —save countless cleaning hours in the kitchen. In fact, a recent study in the midwest showed a *monthly savings of 581 manhours— approximately $886.00.*

Disposable and hygienic, there is a meal-full serving in each seasoning packet . . . – superfine Diamond Crystal Salt; cy, ground black pepper; fine granulated sugar.

See how you can save time, money and labor. Mail the coupon below for a free trial offer.

**DIAMOND CRYSTAL SALT CO.**

SALES OFFICES: Akron, Atlanta, Boston, Charlotte, Chicago, Detroit, Louisville, Minneapolis, New Orleans, New York.

PLANTS: Akron, O., Jefferson Island, La., St. Clair, Mich.

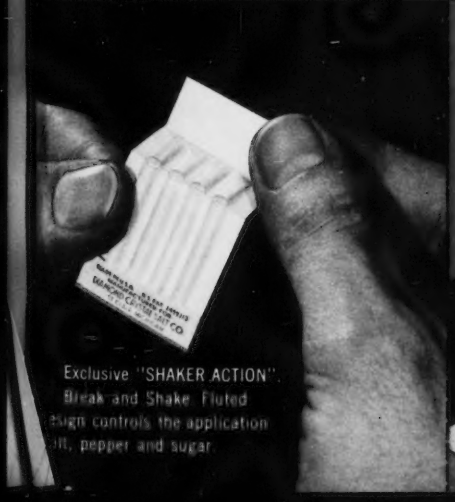
BLACK PEPPER
TO OPEN BREAK BACK ON DOTTED LINE
DIAMOND CRYSTAL WEATHER PROOF SALT (GRAND)
CALCIUM SILICATE ADDED
TO OPEN BREAK BACK ON DOTTED LINE
DIAMOND CRYSTAL SALT CO.

DISPOSABLE. SANITARY.

Patients appreciate the modern convenience of packets.

Eliminate the time and labor required to wash and sterilize breakable dispensers.

Speed up service at mealtimes . . . save countless hours in the kitchen.

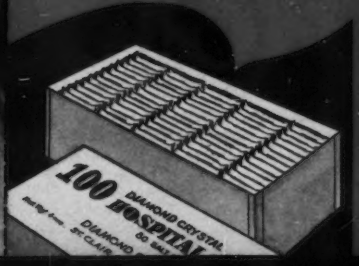


Exclusive "SHAKER ACTION". Break and Shake Fluted esign controls the application lt, pepper and sugar

# FREE

No Obligation

**Diamond Crystal Packets**

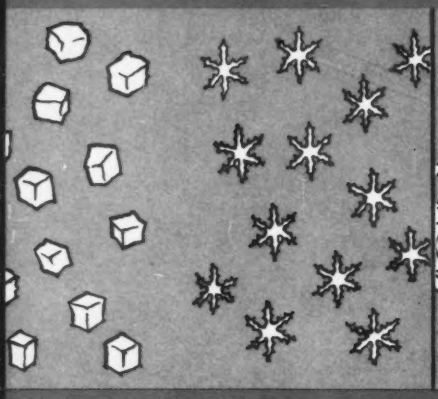


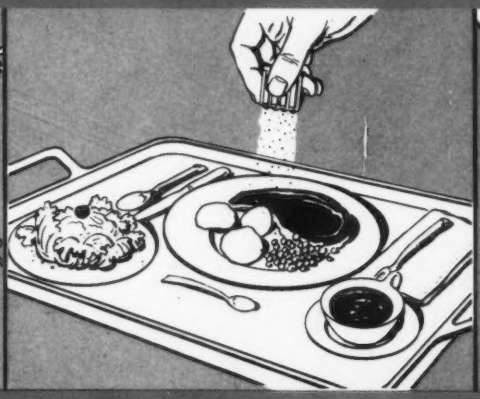

PLACE STAMP HERE

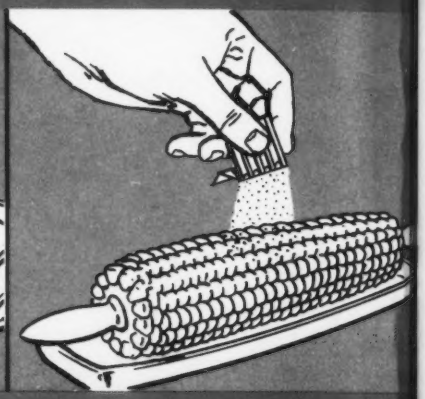
Institutional Sales Department
Diamond Crystal Salt Co.
St. Clair, Michigan

*The only salt that's really different*

# DIAMOND CRYSTAL SUPERFINE







**SUPERFINE FLAKES** . . . Completely different from ordinary cube-like granulated salt. Diamond Crystal's exclusive process produces soft, fine flakes of gentle salt—*99.95% PURE.*

**DISSOLVES FASTER** . . . Diamond Crystal Salt goes to work instantly—sinks deep down into all fine foods to bring out the hidden flavors.

**CLINGS BETTER** . . . Unlike granular salt—the flakes of Superfine Diamond Crystal stick to foods—melt instantly. And the exclusive "Shaker Action" helps prevent over seasoning.

## New—Salt and Sugar Substitute

Now Diamond Crystal has added Salt and Sugar Substitutes to its rapidly growing packet line. The new Salt Substitute contains Potassium Chloride, Glutamic Acid and inert excipients. It closely resembles salt in taste, appearance, stability and pouring qualities.

With 30 times the sweetening power, the new Sugar Substitute has the equivalent of two teaspoonsful of sugar—and it's 100% calorie free.

Each packet contains enough substitute for a complete meal.

## TRY THIS TEST

*Gentlemen:* Please send, without obligation, a FREE sample box of:

- ☐ Salt, pepper and sugar packets
- ☐ Salt and Sugar Substitute packets

Name_____ Title_____

Hospital_____

Address_____

City_____ State_____

You can always recognize superfine Diamond Crystal when you compare it with ordinary cube-like salt. Look for the fine flakes . . . feel the softness . . . taste the mildness. It's the purest table salt in America.

# History of The American Dietetic Association

**1917-1959**

**Mary I. Barber, Editor**

This is the first official history of the ADA from its inception in 1917 through 1959. More than being merely a record of the Association, its origin, structure, aims and accomplishments, this new book includes the many personalities that represent its leadership and explores the role of the dietitian from ancient times to the Space Age.

Chapter 1 considers the term "dietitian" historically, and presents a definition which describes the dietitian's responsibilities today. Chapter 2 outlines the history of dietetics from the ancient Ebers papyrus to the present, highlighting the achievements of great figures in the history of nutrition.

Chapter 3 gives an interesting account of the founding of the ADA. Chapters 4 through 7 record by decades the spectacular advances both of the ADA and of the science in general. Chapters 8 through 14 describe the structure of the Association, and the work of the various Committees and Sections devoted to education, community nutrition, diet therapy, etc.

Chapters 15 through 19 cover the history of dietitians in military and government service, the United States Children's Bureau and the role of the Journal of the ADA and the Association's Public Relations Department. Chapter 20 relates the challenging aspects of dietetics in the Space Age.

**328 Pages • 50 Illustrations**

**NEW, 1959 • $6.00**

**J. B. LIPPINCOTT COMPANY,** East Washington Square, Philadelphia 5, Pa.
In Canada: 4865 Western Avenue, Montreal 6, P.Q.

Please enter my order and send me:

☐ **HISTORY OF THE AMERICAN DIETETIC ASSOCIATION . . . . . $6.00**

Name..... ☐ Charge

Address..... ☐ Payment Enclosed

City..... Zone..... State..... ☐ Convenient Monthly Payment

JADA

# HELP US KEEP THE THINGS WORTH KEEPING

Here's what peace is all about. A world where busy little girls like this can stand, happily absorbed in painting a bright picture that mother can hang in the kitchen and daddy admire when he gets home from work.

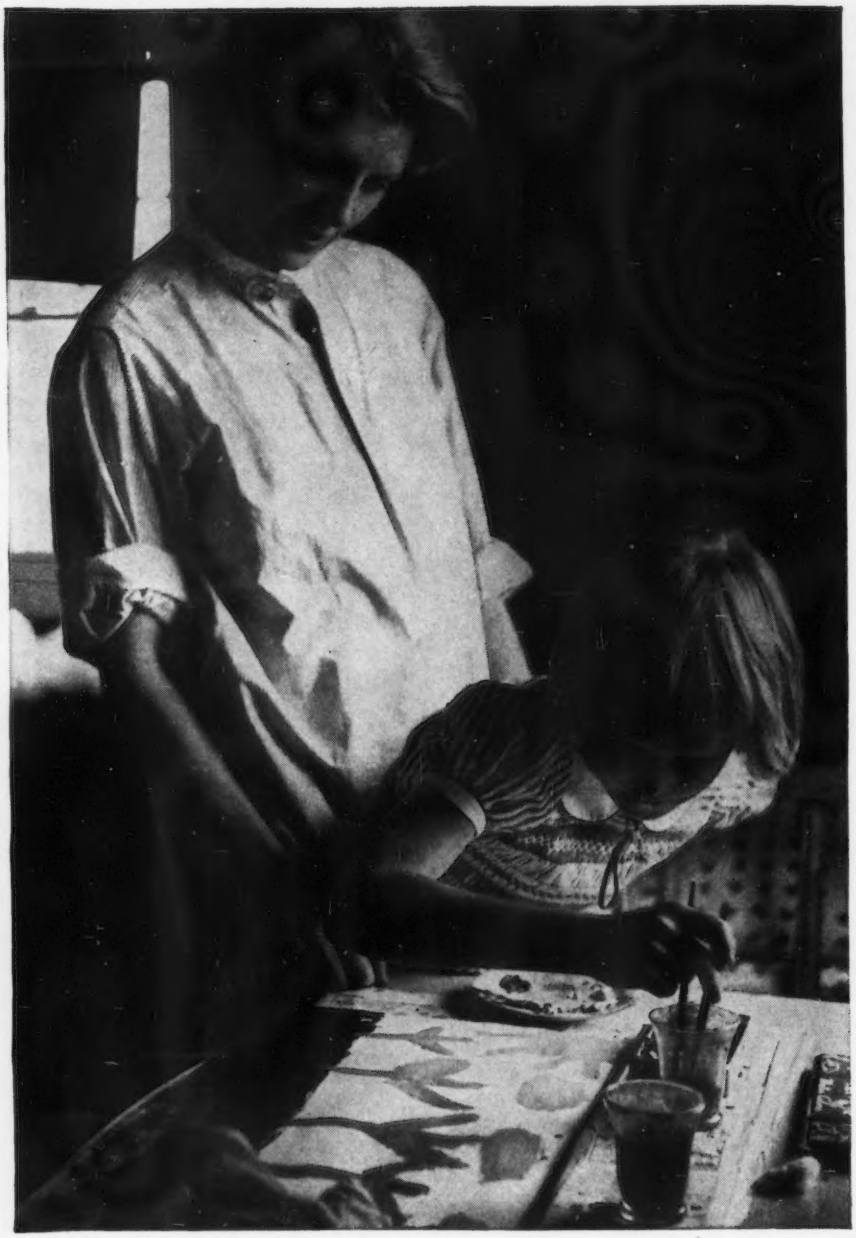
A simple thing, peace. And a precious one. But peace is not easy to *keep*, in this troubled world. Peace costs money.

Money for strength to keep the peace. Money for science and education to help make peace lasting. And money saved by individuals to keep our economy sound.

Every U.S. Savings Bond you buy helps provide money for America's Peace Power—the power that helps us keep the things worth keeping.

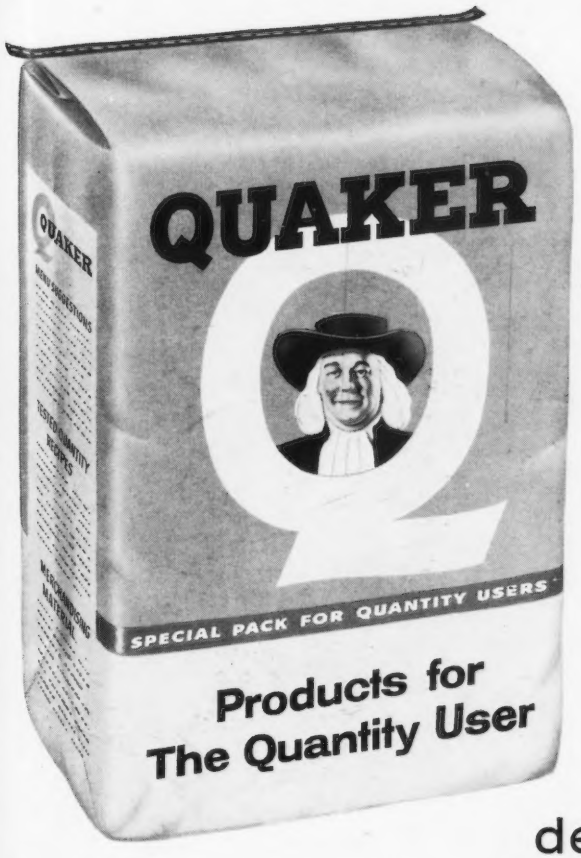
Are you buying as many as you *might?*

HELP STRENGTHEN AMERICA'S PEACE POWER



# BUY U. S. SAVINGS BONDS

*The U.S. Government does not pay for this advertising. The Treasury Department thanks The Advertising Council and this magazine for their patriotic donation.*




# New! The Big "Q" line of cereals and mixes

## designed specifically for the quantity user

...plus Big "Q" Portion Packs for individual service

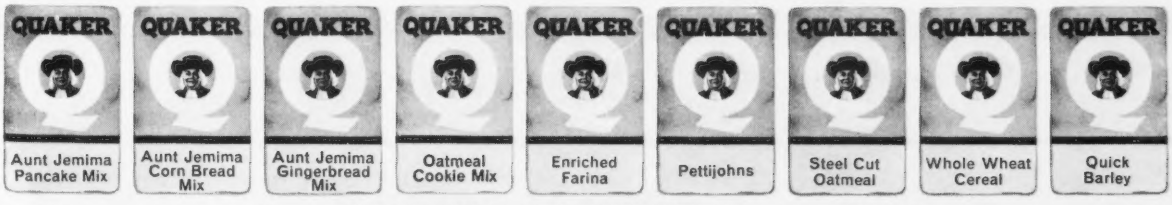
Designed to satisfy the demand for individual servings and where exceptions have to be made to mass-feeding preparations.

- **Aunt Jemima Portion Pack Pancakes**
- **Portion Pack Quick Quaker Oats**

Everyone knows that you can't take "grandma's favorite recipe," multiply it by ten and still keep the results appetizing and satisfying. Because volume feeding requires different food ratios and preparation techniques, Quaker has designed a line of pre-blended flours and cereals to give you standardization and quality controlled products. It's the Big "Q" line of ready foods. Just add liquid—the blends are complete—and cook. Saves time! Lets you watch over costs. Perfect for any *size* operation.

Big "Q" products are available in easy-to-handle 5 lb. (Pettijohns 4 Lb.) packs with protective inner liner. You gain the flexibility of a bag, receive the protection of a carton. Food handling efficiency is kept up without waste.

Proved in mass-feeding operations, the Big "Q" line gives you positive control over costs and quantities. Ask your institutional distributor about the Big "Q" line, or write for brochure to our address below.




Institutional Food Sales, **THE QUAKER OATS COMPANY,** Merchandise Mart, Chicago 54, Ill.

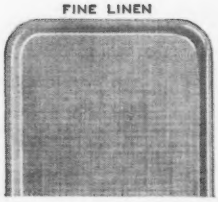
**CLAIRE DE LUNE** by Tatsuihko Heima, Designed for the STIMULUS Collection of Schiffer Prints

# *Bolta*® ... MOST COMPLETE LINE OF TRAYS

The most beautiful, most durable and most economical trays on the market. Wide range of shapes (oblong, oval, round) . . . sizes . . . colors — and prices! Best for every purpose.

**THE GENERAL TIRE & RUBBER COMPANY**
**BOLTA PRODUCTS DIVISION • LAWRENCE, MASS.**

FINE LINEN



BASKETWEAVE

A PRODUCT OF
**GENERAL**
The General Tire & Rubber Company

BOLTABILT

COMPARTMENT TRAY

8365

Prints
AY